

Chapter 2. Alternatives, Including the Proposed Action

2.1 Introduction

The beginning of this chapter discusses resource considerations common to all action alternatives considered by the IDT, followed by a description of each alternative including specific treatment design methods and locations, followed by disclosure of key mitigation and monitoring legal frameworks. The end of this chapter presents a comparison of the alternatives in tabular format, further discussed in narrative format in chapter 3, followed by a discussion of an alternative considered but eliminated from detailed study.

2.1.1 Alternatives Considered in Detail

The *National Environmental Policy Act* (NEPA) is our country's basic charter for environmental responsibility. The NEPA applies when a federal agency has discretion to choose amongst one or more alternative means of accomplishing a particular goal (Council on Environmental Quality [CEQ] NEPA Regulations, 40 CFR § 1508.23). In compliance with the NEPA, Alternative A (no action) is included and analyzed as a baseline against which the action Alternatives B, C, and D can be compared. Alternative B fulfills direction for testing *Herger-Feinstein Quincy Library Group Forest Recovery Act* (HFQLG FRA) Pilot Project vegetative, fuels reduction and riparian restoration activities requiring a non-significant Forest Plan amendment (see 2004 SNFPA ROD: Table 2). Alternatives C and D are designed in accordance with the Plumas National Forest Land and Resource Management Plan (PNF LRMP) (USDA 1988) as amended by the Sierra Nevada Forest Plan Amendment Final Supplemental EIS (SNFPA FSEIS) and Record of Decision (ROD) (USDA 2004a, 2004b).

2.1.2 Alternative Development

The following section discloses the rationale underlying the development of alternatives analyzed in detail to achieve management intents and address cumulative watershed effects.

2.1.2.1 Watershed Health

Protection of water quality and quantity is an important part of the Forest Service's mission, along with controlling point and non-point source pollution, such as road-generated erosion leading to in-stream sedimentation. Although watershed systems can tolerate certain levels of land disturbance; there is a point when cumulative events begin to significantly impact water quality and dependent resources including aquatic habitats. In Rabbit Creek subwatersheds 5, 6, and 8 surrounding the community of LaPorte and subwatersheds 11 and 15 in the area of Secret Diggings (see figure 2-1), historic large scale hydraulic mining and high density road building (6.32–9.59 mi/mi²) contributing to significant cumulative watershed effects (CWE) are far-reaching.

As landscape scale restoration necessary to reverse cumulative watershed effects is constrained by multiple land ownerships and jurisdictions, regulatory and financial resources, the interdisciplinary team (IDT) targeted correcting road-generated point source erosion near streams and rare aquatic habitats, and establishing fire-resilient forest conditions to lower the likelihood of disturbances

disrupting hydrologic recovery over the long term. All action alternatives incorporate Best Management Practices (BMPs) and similar streamside treatments, designed to promote quality aquatic and riparian habitats while preventing or diminishing further adverse effects to water quality.

Best available science indicates typically only a small proportion of road segments within a large forest road network generate most of the road-related increases in sediment yields (MacDonald 2007). Field observations and monitoring data indicate road sediment deliveries can be greatly decreased by improving road drainage to disconnect the pathways leading between road templates and stream systems.

For this reason, all action alternatives incorporate the following standards for temporary road construction, road reconstruction and road relocation: (1) design new stream crossings and replacement stream crossings to support a 100-year flood and bedload and debris; (2) design stream crossings to minimize the diversion of streamflow out of the channel and down the road in the event of a crossing failure; (3) design stream crossings to minimize disruption of natural hydrologic flow paths, including minimizing diversion of streamflow and interception of surface and subsurface water; (4) avoid wetlands or minimize effects to natural flow patterns in wetlands; and (5) avoid road construction in meadows.

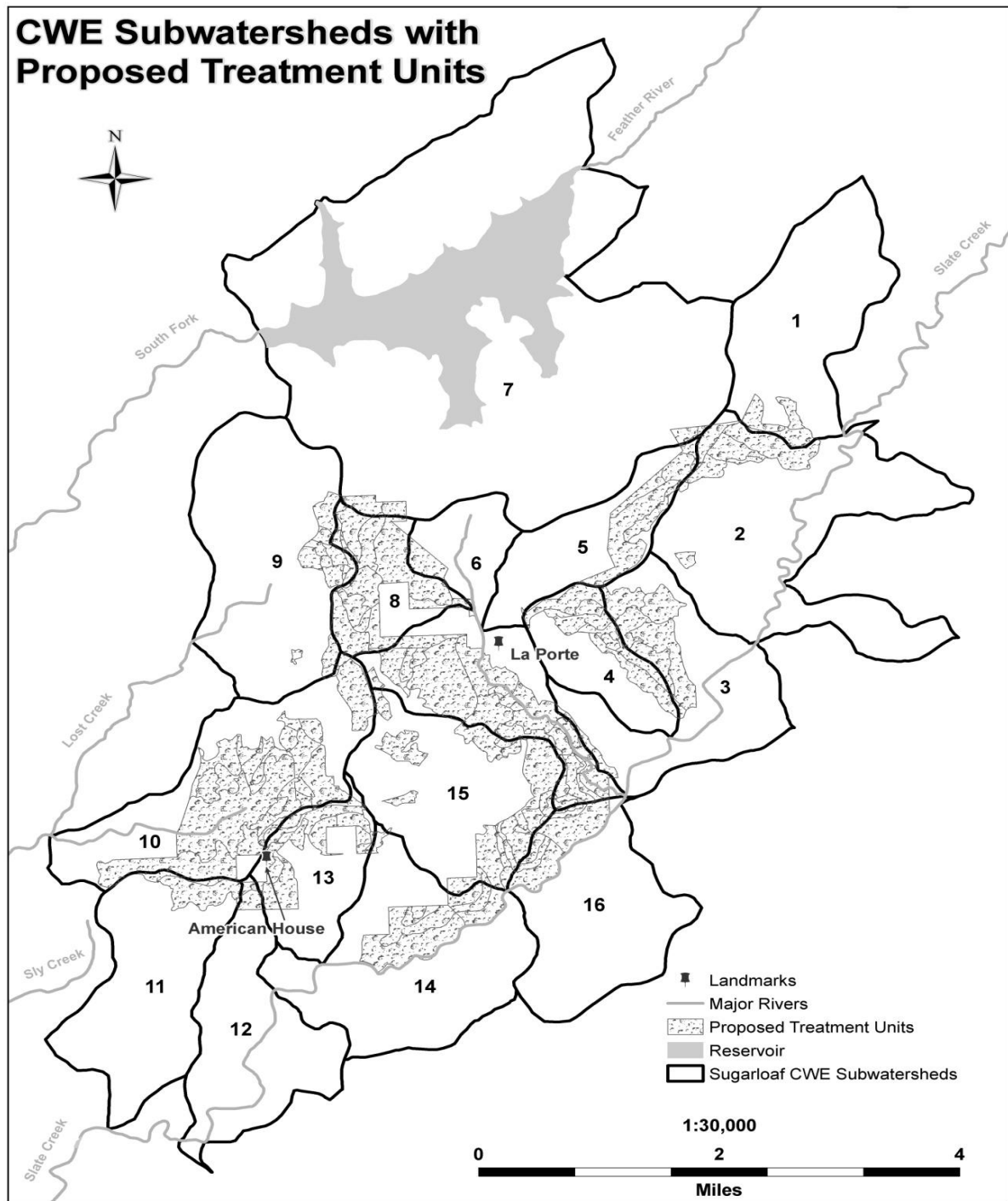
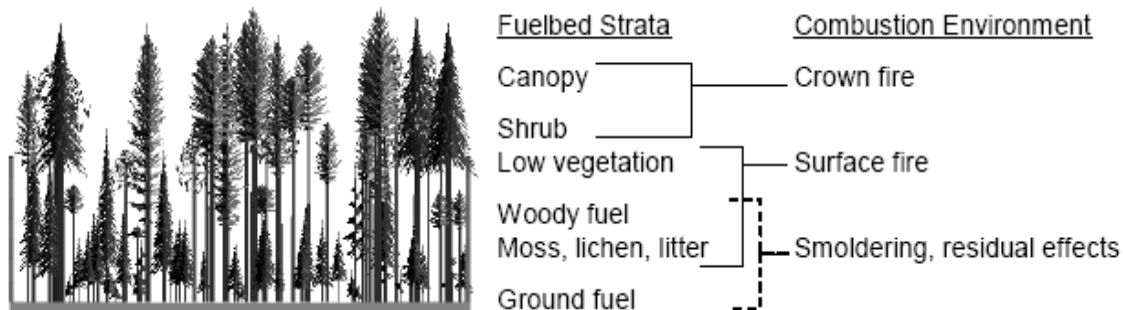


Figure 2-1. Subwatersheds 5, 6, and 8 surrounding the community of LaPorte and subwatersheds 11 and 15 are most at-risk to significant cumulative watershed effects (CWE). The areas without shading include private land and National Forest System (NFS) lands where no treatments are proposed for the Sugarloaf Project.

2.1.3 Hazardous Fuels

The IDT devised a sequenced fuels reduction strategy common to all action alternatives targeting ground or surface fuels, ladder fuels (shrubs and low vegetation) and canopy fuels (tree crowns) influencing fire behavior, as displayed below.



Woody ground or surface fuels such as sound logs, rotten logs, stumps, and wood piles from either natural causes or management activities would be treated using prescribed fire. Down wood can greatly increase energy release from surface fires and can in some cases increase flame lengths sufficiently to ignite ladder fuels and canopy fuels. Moss, lichens, and litter on the forest floor can also increase energy release in surface fuels.

The tree canopy is the primary stratum involved in independent crown fires. The spatial continuity and density of tree canopies, combined with fuel moisture and wind, influence the rate of fire spread and severity. The IDT proposes mechanical tree removal using a range of prescriptions to modify this fuelbed stratum. As the primary management intent is to affect fire behavior and support effective fire suppression, proposed fuel reduction treatments emphasize alteration of forest vegetative structure in all three fuelbed strata. Historic fire records and local weather trend data indicate prevailing wind direction tends to travel from the south and southwest to the north and northeast in alignment with the orientation of drainages such as Slate Creek, Spanish Ravine and Rabbit Creek. As the communities of LaPorte and American House are topographically positioned at the upper headwaters of these drainages, fire would likely funnel upslope with these communities directly in the path of the flame front.

All action alternatives would apply the most intensive fuels reduction treatments on south-facing slopes in the wildland urban interface (WUI) roughly 1/4 mile around LaPorte and American House, focused on reducing risks to life and property from wildfire. All fuels reduction activities are positioned to fill in gaps in defensible fuel profile zones (DFPZs) established under the HFQLG Act, link to defensible space projects on private lands and follow along paved roads to leverage fire suppression effectiveness (see figure 2-2 below).

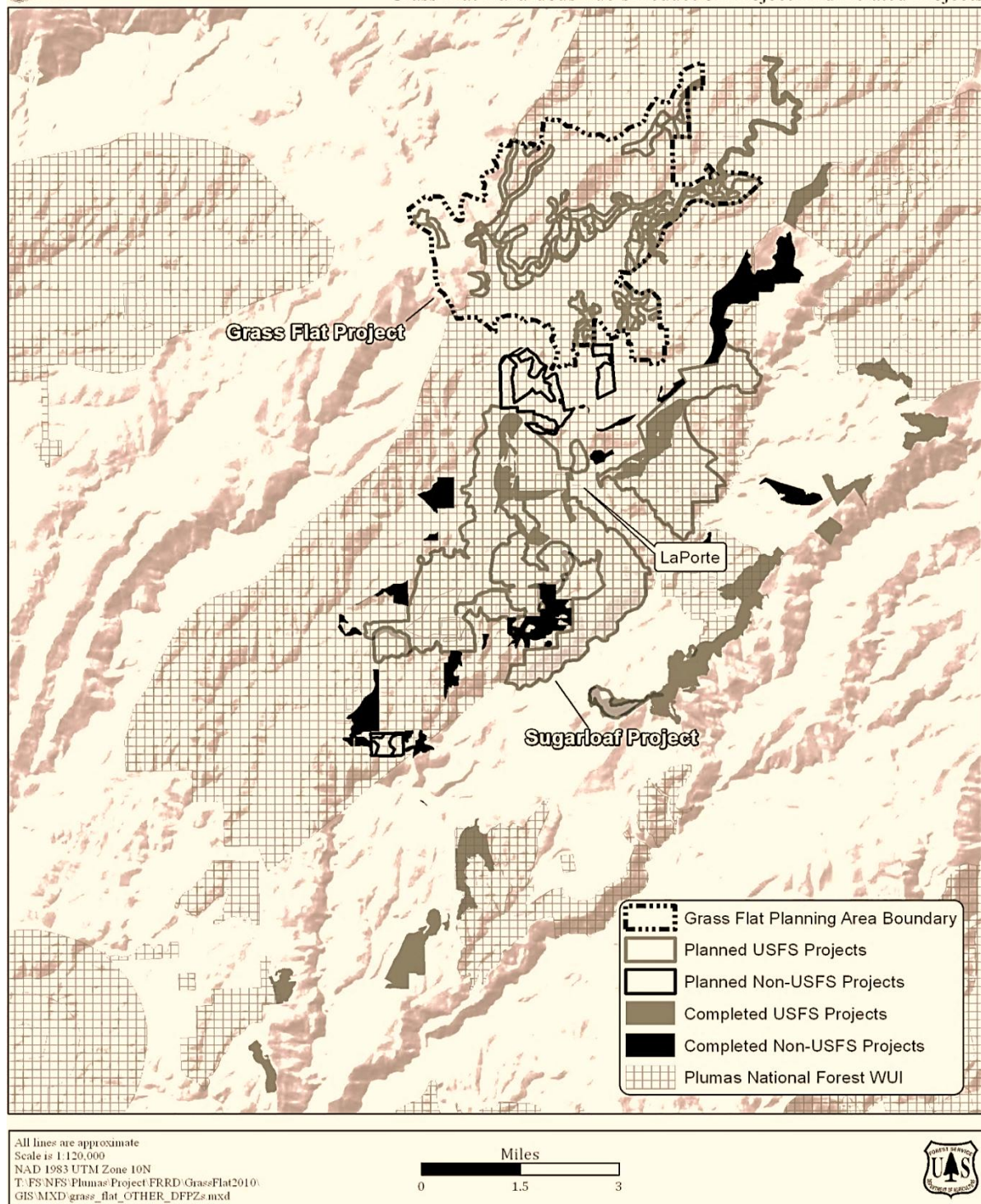


Figure 2-2. Illustration of the larger defensible space network in the wildland urban interface (WUI) defense and extended threat zones.

Grasses, herbs shrubs and seedlings can carry surface fires when that vegetation is dead or has low moisture content. The IDT proposes a range of hand cutting, Machine (grapple) piling, pile burning, and mastication over the next decade to break up fuel continuity.

Outside the WUI defense zones (over a 1/4 around communities), historical fire spread and intensity, historical weather patterns, topography and location of sensitive watersheds and rare habitats influence treatment intensity and locations. The following design criteria are common to all action alternatives:

- Modify the amount, structure and pattern of vegetative fuel conditions to interrupt fire spread across the landscape, with treatment prescriptions designed to modify fire behavior within the treated area;
- Masticate trees less than 9.9 inches at diameter breast height (dbh), including hardwoods on slopes less than 45 percent slope;
- Within 1/4 mile of private properties on south facing slopes, reduce forest canopy cover to 40 percent;
- Near streams, selectively hand cut, pile and burn and apply understory burning, whereby fire is ignited upslope so that only low intensity flames creep downhill in a mosaic pattern.

Beginning in 1982, the USDA Forest Service advanced the fire danger rating system comprised of 13 fire behavior fuel models (Anderson 1982) to 40 fire behavior fuel models (FM) (Scott and Burgan 2005); now a predictive tool commonly used in project planning. The use of FMs by the IDT during alternative development provided a method to predict likely fire behavior outcomes correlating to mapped California Wildlife Habitat Relationship (CWHR) types, to determine where sensitive watersheds, botanical and rare habitats are most vulnerable to crown fire effects.

This correlation between fuel models and CWHR types underlies the combination, placement and intensity of proposed ecologically appropriate treatments introduced in the following section: Representative Ecological (CWHR) Types. A range of tree diameter and canopy closure thresholds, low to moderate mixed severity prescribed fire treatments, and provision for scattered individual tree and patches of tree mortality for biodiversity were considered, with provision for economic outcomes (see the following sections on Forest Health, Economic Stability, and Alternatives B, C, and D).

2.1.4 Forest Health

Closed forest canopies tend to shift tree species composition from shade-intolerant pine dominated stands to shade-tolerant, white fir dominated stands as depicted below (figure 2-3) all of which have largely decreased landscape level forest heterogeneity (diversity). Despite the potentially greater resilience of large trees to survive wildfire, even in high tree density forest conditions, the present density of understory vegetation is consuming available water and nutrients important to their survival.

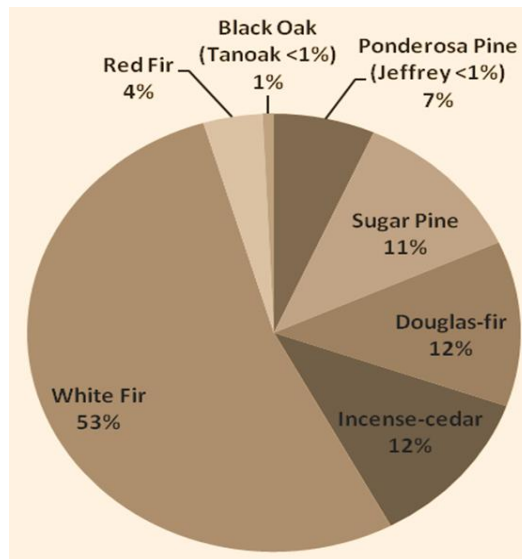


Figure 2-3. Existing average species composition of all stands in the Sugarloaf Project area, as a percentage of total basal area.

Dense or closed forest canopies tend to suppress establishment and survival of tree seedlings on the forest floor. As thick duff prevents bare soil contact necessary for regeneration, and continuous tree crown closure captures and stores precipitation (moisture) and restricts solar penetration, the photosynthesis process becomes interrupted and growth fails.

2.1.4.1 Representative Ecological (CWHR) Types

The following section describes the existing condition by type, desired conditions and appropriate treatment method options for areas outside the immediate 1/4 mile WUI defense zone buffer, designed to achieve desired conditions.



CWHR 4 and 5 size classes in mixed conifer riparian type

Variable density thinning, thin from below and area thinning treatments are appropriate in the outer riparian zone. Hand thin treatments are appropriate in the inner riparian zone, followed up with underburn.

Existing mixed conifer riparian characteristics. This suite of forest types occurs along perennial and intermittent streams throughout the project area. Large trees of any species may dominate depending on local site conditions, with heavy ingrowth of small to medium diameter white fir, Douglas-fir, and/or incense-cedar. The understory varies with local site conditions (topography, canopy cover) and stream characteristics (timing and magnitude of flow), ranging from sparse (north aspects, dense forests, adjacent to intermittent streams) to robust (south aspects, open forests, adjacent to perennial streams), and often composed of mesic species such as bracken fern and mountain dogwood. Snags and coarse woody debris are primarily composed of small and medium size white fir. Vegetative conditions correlate to FM TU5.

Desired conditions: Retain a minimum of 50 percent canopy cover on south/west aspects, and 50–60 percent canopy cover on north/east aspects correlating to a FM TL1 or TL3 (fire spread rate is very slow to slow and flame length is very low to low). Understory vegetation will increase in cover and diversity.



CWHR 4 and 5 size classes in pine-dominated mixed conifer type

Variable density thinning and area thinning treatments are appropriate, followed up with underburn.

Existing pine-dominated mixed conifer characteristics: This forest type generally occurs on ridges and south/west facing slopes, at lower elevations of the project area. Medium to large diameter pine (ponderosa, sugar, Jeffrey) tend to dominate, with heavy ingrowth of small to medium diameter white fir and incense-cedar; individuals and clumps of black oak are often present. The understory is generally absent or sparse (prince's pine, snowberry, chinquapin, manzanita in canopy gaps). Snags and coarse woody debris are primarily composed of small size white fir. Vegetative conditions correlate to FM TU5.

Desired Conditions: Retain a minimum of 40 percent canopy cover on ridges, south/west aspects, upper slopes and 40–50 percent canopy cover on north/east aspects, lower slopes, and near drainages. Vegetative conditions correlate with FM TL1. Understory vegetation will increase in cover and diversity.



CWHR 4 and 5 size classes in mixed conifer type with black oak clumps

Variable density thinning and area thinning treatments are appropriate, followed up with underburn.

Existing characteristics of mixed conifer with black oak clumps: This forest type generally occurs on ridges and south/west facing slopes, at lower elevations of the project area. Medium to large conifers currently dominate, often shade-tolerant species (i.e., white fir, Douglas-fir), with heavy ingrowth of small to medium diameter white fir, Douglas-fir and incense-cedar; individuals and clumps of black oak are present. Black oak clumps currently consist of intermediate and large size trees of low vigor and low crown ratio, with numerous dead trees. The understory is generally absent or sparse. Snags and coarse woody debris are primarily composed of small size white fir and black oaks of all size classes. Vegetative conditions correlate to FM TU5.

Desired conditions: Retain a minimum of 40 percent canopy cover, thinning small and intermediate sized shade-tolerant conifers around individuals and clumps of black oaks, and within clumps if possible while avoiding damage to residual trees. Vegetative conditions correlate with FM TL1. Understory vegetation will increase in cover and diversity, oak canopy cover will increase, and successful oak regeneration will establish.



CWHR 4 and 5 size classes in moist mixed-conifer type

Group selection (GS), variable density thinning, and area thinning treatments are appropriate, followed up with underburn.

Moist mixed conifer characteristics: This forest type is well distributed throughout the project area, with medium and large diameter trees of all species (Douglas-fir, sugar pine, ponderosa pine, incense cedar, white fir) dominant and heavy ingrowth of small to medium diameter Douglas-fir, white fir, incense cedar; individuals and clumps of black oak may occur. The understory is highly variable, ranging from sparse to dense (dogwood, hazelnut, bracken fern, prince's pine, snowberry, chinquapin, manzanita); snags and coarse woody debris consisting of all species and size classes. Vegetative conditions correlate to FM TU5.

Desired Conditions: Retain 40 percent canopy cover on ridges, south/west aspects, upper slopes with more pine/oak; 40–50 percent canopy cover on ridges, south/west aspects, upper slopes with more fir/cedar, north/east aspects, lower slopes, near drainages with more pine/oak; and 50–60 percent canopy cover on north/east aspects, *lower* slopes, near drainages with more fir/cedar. Vegetative conditions correlate with FM TL1 or TL3. Understory vegetation will increase in cover and diversity.



CWHR 4 and 5 size classes in White-fir and fir-dominated mixed conifer type

Group selection (GS), variable density thinning, thin from below and area treatments are appropriate, followed up with underburn.

White-fir and fir-dominated mixed conifer characteristics: This forest type generally occurs on north/east facing slopes at higher elevations; generally dominated by dense small and medium size white fir and scattered medium and large individual white fir, incense cedar and sugar pine. The understory tends to be sparse (currant, gooseberry, snowberry, prince's pine, whitethorn, chinquapin, and huckleberry oak in canopy gaps); with snags and coarse woody debris mostly composed of white fir.

Desired Conditions: Retain 40–50 percent canopy cover on ridges, south/west aspects, upper slopes and retain 50–60 percent canopy cover on north/east aspects, lower slopes, near drainages. Vegetative conditions correlate with FM TL3. Understory vegetation will increase in cover and diversity.

**CWHR 3 size class in older pine plantation type**

Mastication treatment is appropriate, followed by with underburn.

Older pine plantations characteristics: This forest type is dominated by ponderosa pine, 15–30 years old, 8–12 inch diameter, with 8–12 foot spacing. Natural regeneration tends to be variable (light to heavy), composed of white fir, incense cedar, Douglas-fir. The understory tends to be variable (sparse to heavy), composed of manzanita, whitethorn and deerbrush.

Desired Conditions: Retain largest and most vigorous trees of representative species at 18–25 foot spacing, with increased canopy base height and reduced ladder fuels, correlating to FM TL1 (Spread rate is very low; flame length very low). Understory vegetation diversity will increase.

**CWHR 1 and 2 size classes in younger pine plantation type**

Mastication and hand thin, pile and burn treatment are appropriate.

Younger pine plantations characteristics: This forest type is dominated by ponderosa pine that are <20 years old, <8 inch diameter, 8–12 foot spacing (variable); natural regeneration tends to be variable (light to heavy), composed of white fir, incense cedar and Douglas-fir. The understory tends to be heavy with manzanita, whitethorn, deerbrush, chinquapin and bitter cherry.

Desired Conditions: Retain largest and most vigorous trees of representative species at 18–25 foot spacing, with increased canopy base height and reduced ladder fuels, correlating to FM TL1. Understory vegetation diversity will increase.



CWHR 1 & 2 size classes in Douglas-fir and mixed-species plantation type

Mastication followed by with hand thin, pile and burn treatment are appropriate.

Douglas-fir and mixed-species plantations characteristics: This forest type is dominated by Douglas-fir, or Douglas-fir and pine, may include sugar pine, ages range 10–30 years old, diameters range 2–12 inch highly variable spacing. Natural regeneration tends to be variable (light to heavy), composed of white fir, incense cedar, Douglas-fir. The understory tends to be variable (sparse to heavy), whitethorn, manzanita, chinquapin, huckleberry oak, dogwood, snowberry and bitter cherry.

Desired Conditions: Retain largest and most vigorous trees of representative species at 18–25 foot spacing, with increased canopy base height and reduced ladder fuels, correlating to FM TL1 or TL3.

2.1.4.2 Treatment Method Descriptions

The following section provides a detailed description of mechanical, manual (hand work), prescribed fire and road related activities, introduced under the previous discussion of representative ecological (CWHR) types considered sustainable and appropriate.

Alternative B only - Area Thinning (AT): This treatment is designed to treat ladder fuels and vegetation density by removing branches and limbs that extend to the ground, as well as removing smaller, densely spaced trees to create a greater distance between the ground surface and crown, as well as greater space between trees and tree crowns. Area Thinning treatments would be implemented where desired forest canopy is 40+ percent cover, in combination with variable density thinning methods, in small and medium tree dominated CWHR size classes 2 and 3, and in select Riparian Conservation Areas (RCAs) and other restrictive land allocations.

Area thinning would mechanically remove ladder and crown fuels, thereby increasing canopy base height, spacing between trees, and spacing between tree crowns. Treatment prescriptions would allow harvest of the smaller, suppressed, intermediate-crown-class trees and some co-dominant and dominant trees to achieve residual conifers with approximately 15 to 20 feet spacing between individuals and clumps. Species preference for the residual trees would include shade-intolerant species where they exist. Ponderosa, sugar and Jeffrey pine are most preferable, followed in order by black oak, Douglas-fir, incense-cedar, and true fir. The largest hardwood and conifer snags (>15 inches dbh) would be retained at 4 to 6 per acre.

Alternative B only - Group Selection (GS): Harvest small and medium conifers (with the exception of pine species) for example Douglas-fir, white fir, and incense-cedar from around individuals and clumps of large trees (all species) equal to or greater than 30 inches dbh, limiting forest openings to a maximum 2 acres, allowing for the retention of pine and black oak (all tree size classes). Specifically identified trees remain as seed trees for regeneration. Site preparation within group selection (GS) treatment areas would include mechanical piling and burning to treat activity slash and brush competition as well as slope re-contouring or subsoil ripping. Following site preparation, GS openings may be replanted with a shade-intolerant species mix composed of mainly rust resistant sugar pine (30 percent) and Jeffrey pine (70 percent). Natural regeneration from seeds of surrounding firs and incense-cedar is also expected to occur in these openings. First and third year survival surveys would be conducted to monitor seedling survival. If necessary, competing brush and grass within GS treatment areas would be controlled by manual grubbing and/or hand-cutting to ensure survival and growth of young seedlings.

Alternative D only - Variable density (radial) thinning(VDT): Removal of individuals and groups within stands, of various sizes and densities. Thin small and medium size white fir and Douglas-fir less than 24 inches dbh growing beneath the tree crown drip line of large individuals (see graphic) and small clumps (2-4 trees) of pine and oaks greater than 16 inches dbh both beneath large trees and in open stands without creating openings, favoring the retention of the healthiest, largest, and tallest Douglas-fir, incense-cedar, pine and oaks.

Thin small and medium size white-fir from around individuals and small clumps (2–8 trees) of medium and large size, pine, incense cedar, and black oak. Where clumps exist, retain the healthiest, largest, and tallest white fir, incense-cedar, pine and oaks; limiting openings to less than 1/4 acre.

Variable thinning prescription will be modified within 100 feet of private homes, town of LaPorte and scenic roadways to maintain a diverse, heterogeneous, multi-storied canopy that incorporates small natural appearing openings of 0.1 acre to 0.5 acre in size; open park-like stands of mature trees where visual penetration extends up to 1/4 mile into the forest; groupings of diverse species with multi-storied canopy (blend of multiple seral stages), and stands of understory vegetation (dogwood, etc.). Large specimen, landmark trees will be retained, particularly sugar pine and Douglas-fir.



Graphic illustration representing desired post treatment forest stand structure of high-density tree groups, gaps, and lower density matrix

Alternatives C and D only – Thin from below: Treatments remove ladder and canopy fuels in order to increase ground-to-crown height, spacing between trees, and spacing between tree crowns. Approximately 40, 50, or 60 percent canopy cover would be retained in mechanical thinning treatment units (CWHR size class 4, 5, or 6). The priority for thinning would be the removal of the smaller, suppressed and intermediate-crown class trees, and removal of some co-dominant and dominant trees with crowns underneath and adjacent to healthy large trees. The preferred species for residual trees are shade-intolerant species where they exist. In order of preference, the shade-intolerant species are ponderosa pine, black oak, Jeffrey pine, sugar pine, Douglas-fir, incense-cedar, and true fir. The spacing of residual conifers would be approximately 18-22 feet apart to allow for retention of the healthiest, largest, and tallest conifers and to avoid creating openings without going below minimum canopy cover for the CWHR size class 4, 5, and 6 stands. Sawlog diameter limits would range from 10.0 to 29.9 inches dbh. All trees 30 inches dbh or larger would be retained, unless removal was required for operability.

Treatments Common to All Alternatives

Riparian Habitat Conservation Areas (RHCAs) and Riparian Conservations Areas (RCAs): Treatments would be limited to mastication, hand thinning, hand piling or mechanical (grapple) piling, pile burning and prescribed underburning. Prescribed fire would be ignited along contour strips upslope of the RHCA and RCAs so as flames creep downslope to promote low intensity fire behavior, aimed at protecting hardwoods and riparian vegetation from scorch (lethal heat levels).

Hand Thinning (Manual) -Hand thinning: Field crews cut understory vegetation greater than 2 feet tall to 9.9 inches dbh (5.9 inches in spotted owl PACs) to a spacing of 18 to 25 feet ($\pm 25\%$) in order to reduce ladder fuels. Hand thinning is generally restricted to areas where mechanical treatment is infeasible due to access restrictions, excessive slope or type/size of vegetation being removed. Shrubs and trees >2 feet in height to 9.9 inches dbh would be manually cut from beneath overstory trees and/or aggregations of small diameter conifers, followed by hand pile and burn.

Hand Piling/Mechanical (Grapple) Piling and Burning: After vegetation is hand thinned, the cut trees, shrubs and existing slash would be piled by tractor or by hand into burn piles and covered

with a waterproof barrier to keep the material dry. Pile placement would minimize damage to residual trees. The piles are subsequently burned in the winter months or during periods of low fire danger. This treatment removes ladder and surface fuels throughout the treatment unit.

Mastication: A masticator is a low ground pressure piece of equipment that cuts and shreds brush, small understory trees less than 10 inches dbh and downed woody fuels. Trees would be masticated to a spacing of 18–25 feet ($\pm 25\%$). Mastication does not actually remove any wildland fuels from the treated area, but changes the size, continuity, and arrangement of the fuels, resulting in a change in fire behavior.

Underburning: Prescribed fire or underburning would consume surface fuels, understory, and, in rare cases, larger trees. Surface fuels are the primary agent of fire spread. The objective is to apply controlled fire under optimum conditions to modify fuel conditions to effectively reduce fire behavior and the corresponding intensity of a future wildfire. The goal of the treatment in this project would be to consume a significant portion of surface fuels and understory vegetation in order to reduce future fire severity. Underburning includes all of the steps necessary to prepare and implement a prescribed burn. Examples include line construction, ignition, and mop-up of prescribed burns.

Road reconstruction: Along National Forest System (NFS) classified roads, install drainage features (culverts) capable of functioning during a 100-year flood event, adequate to contain increased bedload and debris. Realign stream crossings to remove barriers to natural hydrologic flow paths, including correcting diversion of streamflows and interception of surface and subsurface water.

Alternatives B and D only - Road Decommissioning: For select NFS classified roads eroding near streams, remove drainage features and outslope. Allow for natural vegetative recovery to re-stabilize soils and reduce in-stream sedimentation downhill.

Alternatives B and D only -Road Obliteration: For select legacy, non-classified roads and user created routes eroding near streams, outslope and restore the natural slope gradient. Allow for natural vegetative recovery to re-stabilize soils and reduce in-stream sedimentation downhill.

2.1.5 Economic Stability

The IDT considered current market trends and public advice linked to operational efficiency aimed at affording a broad spectrum of marketable goods and job opportunities to contribute to the economic stability of rural communities. The following design criteria are common to alternatives B, C and D:

- Minimum 5,000 board feet (bf) per acre of sawlog removal (conifers greater than 10 inches dbh) for ground-based logging systems; restricted to less than 35 percent slope;
- Minimum 7,000 bf per acre of sawlog removal for cable (skyline) logging systems;

In general, the sequence of implementation would start with primary mechanical treatments to offset operational costs and reduce fuel concentrations, allowing for secondary manual and prescribed fire treatments; planned for completion in 5–7 years.

Other Resource Considerations:

Visuals. Based on public advice for treatment design elements, the IDT developed the alternatives to respond to social variables including minimizing visually evident activities along scenic byways and proximity to at-risk communities and NFS land amenities (trails, dispersed campsites). All action alternatives B, C and D preserve scenic integrity by prescribing roadside treatments aimed at piquing the viewer's curiosity, accentuating color, texture and use of line and form characteristics of mature forest character, with small areas of different age classes, irregular edges, openings framing meandering stream, wetlands, unique rock outcrop and diverse vegetation.

Wildlife. The IDT's strategy for managing habitats lies within the framework for establishing desired conditions, by directly altering forest and riparian habitat attributes; also aimed at indirectly influencing ecological processes and functions. The desired conditions represent the endpoints underlying treatment methods designed to preserve rare populations.

Management activities on National Forest System (NFS) lands are planned so they do not jeopardize the continued existence of threatened or endangered, proposed, candidate or Management Indicator Species (MIS), or that would lead to a trend toward listing or loss of viability of Forest Service Sensitive species (36 CFR 219). The Sierra Nevada (mountain) yellow-legged frog (SNYLF) is a USFS Region 5 Sensitive Species. The SNYLF is also a federal candidate species for listing by the USFWS under the *Endangered Species Act*. A candidate species is a species that warrants listing but is precluded due to higher priority actions (Fed. Reg. Vol. 68, No 11, 2283-2303). SNYLF have been found in step pools within high gradient Roesgen A and B channel type head water streams on Dark Ravine Creek and its tributaries.

The PNF LRMP 1988 includes management direction aimed at improving habitat capability and sustaining viable populations of aquatic (stream and riparian) dependent species. The SNFPA FEIS and ROD USDA (USDA 2004) include standards and guidelines for surveys, limited operating periods (LOPs), Habitat Monitoring and Riparian Conservation Areas (RCAs) buffers applicable to Alternatives C and D. Direction from the HFQLG Act, FEIS, and ROD (USDA 1999a, b) is unique and only applies to Alternative B. Although land management riparian buffers are defined uniquely, proposed treatment placement and intensities are similar for all action alternatives to mitigate short term risks to watershed resources:

- Retain Sierra Nevada (mountain) yellow-legged frog (SNYLF) habitat by avoiding all treatments in occupied habitat (up to 300 foot buffer).
- Retain sufficient large down wood in streams and on the forest floor for habitat, soil stability and productivity and adequate decaying wood to support insects, rodents and fungal life.

In particular, Alternative B applies standards and guidelines from the *Herger-Feinstein Quincy Library Group Forest Recovery Act* (HFQLG FRA), which defers timber harvesting from spotted owl habitat areas (SOHAs) and CSO PACs. See figure 2-4 for PACs located within and adjacent to the Project area.

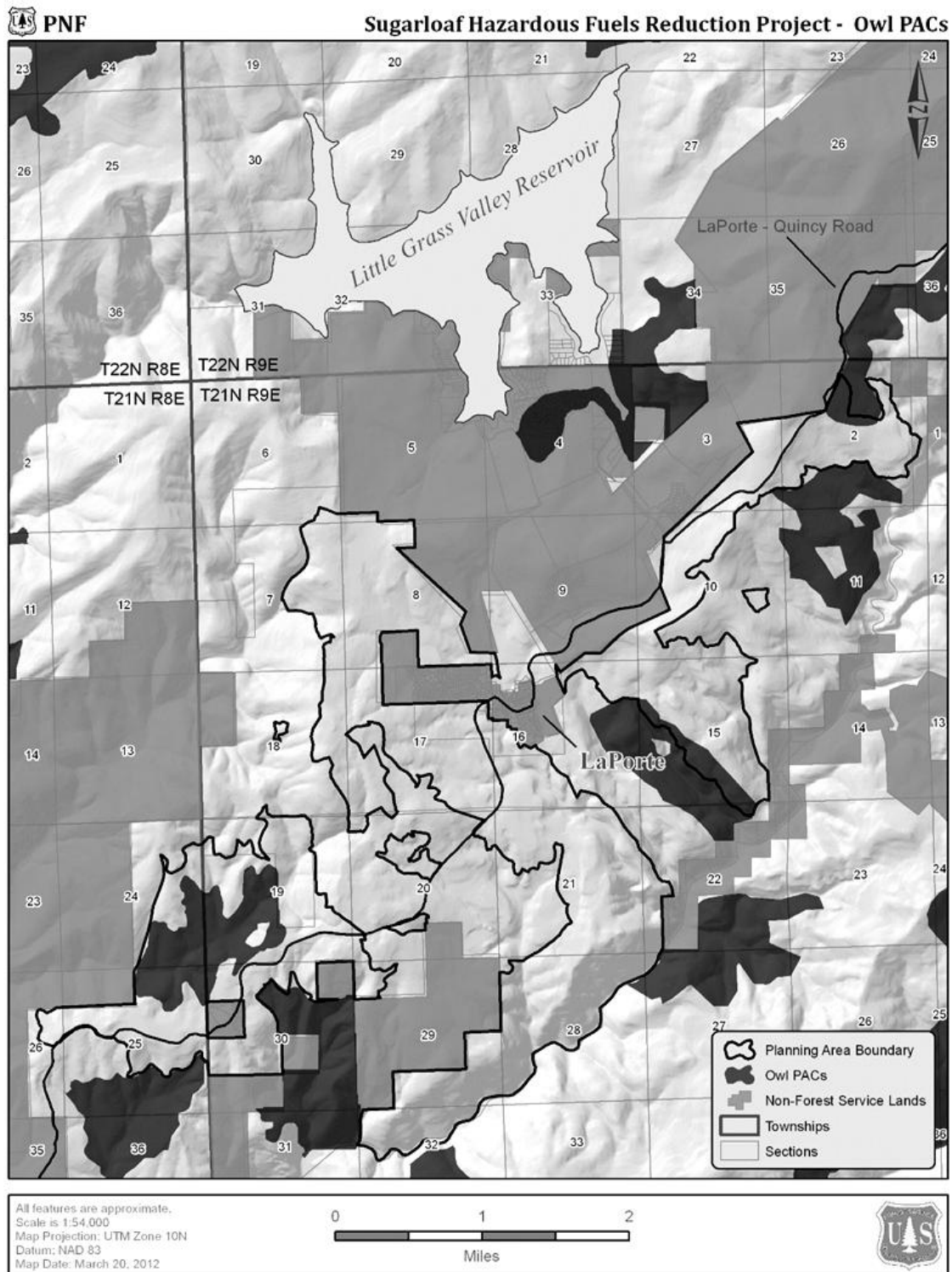


Figure 2-4. Protected Activity Centers (PACs) within the Sugarloaf Project area.

Only habitats considered at high risk to stand replacing wildfire within the WUI zone would be strategically treated using prescribed fire and select hand cutting (manual) methods. Treatments proposed with the Valley Creek Special Interest Area (SIA) and spatially overlapping Northern goshawk (NOGO) PAC and California spotted owl (CSO) PAC would not exceed 5 percent per year or 10 percent per decade; designed to ensure the overall effectiveness of the landscape of fire and fuel strategy. The following design criteria common to all action alternatives would be applied:

- Hand thinning would be limited to trees less than 9.9 inches dbh in general; constrained to less than 5.9 inches in Northern Goshawk Protection Activity Centers (PAC), spatially overlapping the Valley Creek Special Interest Area (SIA).
- A limited operating period (LOP) would be applied to minimize potential for noise and smoke disturbance.
- Retain hardwoods greater than 12 inches dbh and cottonwood trees.
- Retain all live trees greater than or equal to 30 inches dbh. Post-harvest treatment shall retain a minimum acreage of 5 percent in stems of 6-24 inch dbh.
- Retain 40 percent minimum basal area (BA) in the largest trees in CWHR 5M, 5D, and 4D classes.
- Retain important habitat components such as 4 snags (15 inches dbh and greater) per acre on the landscape, and 10–15 tons per acre of large down wood (8–12 logs, 20 inches diameter and 10 foot length minimum) per acre.

Public Health and Safety. The interdisciplinary team (IDT) incorporated standard operating procedures common to all action alternatives to address public health and safety. All project activities (Forest Service and contract) would comply with State and Federal Occupational Safety and Health (OSHA) codes and are guided by FS Handbook 6709.11 (Health and Safety Code Handbook).

1. Conduct prescribed burns when favorable smoke dispersal is forecasted, especially near sensitive Class I areas. Smoke emissions during prescribed burning, fugitive dust from equipment transport and emissions from mechanical equipment during operations would be mitigated by using management practices aimed at minimizing temporary impacts to airshed and driver visibility (drifting smoke).
2. Avoid burning on high visitor days and notify the public before burning.
3. Avoid risk to public safety during timber operations and log hauling by placing road signs and flaggers to direct traffic.
4. Maintain a minimum 50 feet buffer along main roads, trails and residential properties where masticating to reduce risks from sharp-edged slash adjacent to property boundaries.

2.1.6 Alternative A – No-action Alternative

Under the No-action Alternative (A), land management activities would not take place to address the elements of the purpose and need at this time. However, as required by NEPA, Alternative A is included and analyzed in this FEIS as a baseline, against which Alternatives B, C, and D can be compared. Although under Alternative A, no active management is proposed, the lack of action also has discrete, indirect consequences as described in chapter 3 of this FEIS.

2.1.7 Alternative D – Preferred

Alternative D is designed to balance reducing risks to life, property, and rare habitats and recovering watershed resources from wildfire; in addition to supporting economic stability and moving wildlands toward desired ecologically healthy conditions within the framework of land management direction in the Plumas National Forest Land and Resource Management Plan (PNF LRMP) (USDA 1988) as amended by the Sierra Nevada Forest Plan Amendment Final Supplemental EIS (SNFPA FSEIS) and Record of Decision (ROD) (USDA 2004a, 2004b)(see fig. 2-5).

Alternative D would generate an estimated \$277,643 net timber harvest revenue from an estimated 4.6 million board feet of timber to off-set some of the cost of operations and would provide an estimated 147 forestry jobs associated with implementation.

Alternative D best responds to the relevant issue for cumulative watershed effects (CWE) compared to alternatives B and C, by retaining 10–20 percent higher (50–60) forest canopy closure near streams, applying fewer acres of timber harvest including eliminating units requiring skyline (cable) logging systems, and establishing strategic upslope reserves (positioned on steep slopes) designed to minimize the potential for contributing to cumulative watershed effects. This Alternative limits gaps to 1/4 acre in size and employs less intensive area thinning in California wildlife habitat relationship (CWHR) size classes 4M, 4D, 5M, and 5D retaining 50–60 percent canopy closure; particularly near streams.

Alternative D incorporates similar road-related watershed restoration activities as Alternative B. Watershed restoration activities target roads and trails that are intercepting, diverting or disrupting natural surface water flow paths near streams or require drainage infrastructure upgrades to restore flow connectivity. The preferred alternative D is unique in that it would improve road drainage of 1 mile on NFS roads solely to reduce associated in-stream sedimentation, whereas Alternative B includes improvements to expedite timber hauling. Alternative D incorporates forest and watershed road restoration activities as listed below:

- Obliterating 8.8 miles of non-system (unclassified) roads outside the Valley Creek Special Interest Area (SIA);
- Obliterating 1.0 mile of non-system (unclassified) road within the Valley Creek SIA;
- Decommissioning 0.7 mile of NFS (classified) road;
- Redesigning and upgrading road drainage features along priority NFS roads PC511A, 22N53, 21N18A and 21N42Y such as out-sloping road segments, installing armored rolling dips and replacing culverts.

The SNFPA FSEIS and ROD (USDA 2004a, 2004b) allow for project level adjustments to the standard RCA widths described below, if a landscape analysis has been completed and a site-specific riparian conservation objectives (RCOs) analysis demonstrates a need for different RCA widths. The IDT most recently updated the Slate-Canyon Rapid Landscape Assessment (USDA 2013), to determine if adjustments to RCA widths were warranted. The IDT findings indicate changes to standard RCA buffers are not necessary to achieve restoration goals. Alternative D, identical to alternative C, applies standard RCA no treatment or exclusion zone buffer widths as follows:

- *Mastication*: Apply a 75 foot buffer for all perennial streams. Apply a 25 foot equipment exclusion zone buffer for ephemeral streams without annual scour. Apply a 50 foot equipment exclusion zone buffer for all ephemeral streams with annual scour, and intermittent, and perennial streams that do not have fish. Apply a 75 foot buffer on all intermittent and perennial streams that have fish. Note: if Sierra Nevada Yellow-legged Frogs (SNYLFs) are found prior to implementation the 25 foot equipment exclusion zone on intermittent streams would be increased up to 300 feet.
- *Mechanical thinning*: Apply a 50 foot equipment exclusion zone buffer for ephemeral streams without annual scour. Apply a 150 foot equipment exclusion zone buffer for all ephemeral streams with annual scour, and intermittent, and perennial streams that do not have fish. Apply a 300 foot buffer on all intermittent and perennial streams that have fish.
- *Handcut/Pile/Burn (HCPB)*: No buffer on ephemeral streams, but retain at least 50 percent canopy cover and all riparian vegetation post treatment. Piles should be at least 25 feet from edge of stream. Apply a 25 foot buffer to all intermittent and perennial streams that do not have fish. Apply a 50 foot buffer to intermittent and perennial streams that do have fish. No HCPB treatment will occur within these buffers. If SNYLFs are found prior to implementation the no treatment buffer would be set to 75 feet; up to 300 feet, regardless of the stream type (applies to all action alternatives).
- *Hand cut/Grapple Pile (HCGP)*: Apply a 50 foot equipment exclusion buffer for ephemeral streams. Intermittent and perennial streams that do not have fish will have a 75 foot buffer. Apply a 100 foot equipment exclusion buffer for intermittent and perennial streams that do have fish. If SNYLFs are found prior to implementation then an additional LOP will apply within a mile of SNYLFs detection (applies to all action alternatives).
- *Underburning (UB)*: Fire ignition would be prohibited within RCAs and RHCAs, but would be allowed to back into them; exception is aquatic reserves to protect known rare aquatic populations where no underburning (UB) is allowed within 300 feet either side of the stream channel.

2.1.7.1 Variable Density (Radial) Thinning and Thin from Below (Mechanical)

Mechanical treatments are designed to retain 40–60 percent canopy cover using area thinning methods in small and medium tree dominated CWHR size classes 4 and 5, and in select Riparian

Conservation Areas (RCAs) and PACs. Alternative D applies a unique canopy thinning treatment strategy from those proposed under Alternatives B and C.

Alternative D would apply area thinning on south-facing slopes in the WUI defense zone and along ridgetops and upper slopes, allowing for removal of trees up to 30 inch dbh while retaining a minimum 40 percent canopy cover. Forest gaps up to a 1/4 acre are allowable. Forest canopy cover retention increases to 40–50 percent at a minimum on mid-slopes, with variable thinning applied on north aspects; allowing for removal of trees up to 24 inches dbh. The lower slopes and riparian conservation areas (RCAs) would be maintained at 50–60 percent canopy cover using variable thinning methods, allowing for removal of trees up to 20 inches dbh, outside restricted riparian buffers.

Treatments proposed with the Valley Creek Special Interest Area (SIA) and spatially overlapping NOGO and CSO PACs would not exceed 5 percent per year or 10 percent per decade, and would be limited to prescribed underburning. Manual hand cutting of small trees and shrubs is limited to within 250 feet either side of main road access routes; retaining a minimum of 50 percent canopy cover.

The timing of phased, overlapping treatments to reduce ladder fuels in riparian and mechanical harvest units will take place within one to two years post mechanical harvest. Prescribed underburning generally takes place one to five years following mechanical treatment.

The following list describes proposed initial treatments and associated prescriptions:

- 859 acres of mechanical variable density (radial) thinning and 76 acres of thin from below targeting trees less than 30 inches dbh, retaining 40-60 percent forest canopy cover, utilizing ground-based logging systems (see table 2-1 below for prescription description). Canopy cover and diameter limits at the stand level would be based on topography, and within-stand variability would be incorporated by focusing on the creation of clumps and gaps (1/8 to 1/4 acre in size). Trees greater than 10 inches dbh would be removed as sawlogs.
- 3.6 miles of NFS road reconstruction, 2 miles of temporary road construction and 24 new landings.
- 911 acres of hand thin, pile, and pile burn trees less than 10.0 inches dbh (5.9 inches in PACs) to reduce tree density and ladder and surface fuels.
- 71 acres of hand thin, grapple pile, and burn to reduce tree density and ladder and surface fuels.
- 278 acres of masticating brush and trees less than 10 inches dbh to reduce tree density and ladder fuels. Remaining conifers and brush will have an 18–25 foot spacing and hardwoods will be retained except where removal is necessary to facilitate operations.
- 1,558 acres low to moderate intensity prescribed underburn to reduce ladder and surface fuels.

The following list describes proposed secondary treatments and associated prescriptions:

- 490 acres of hand thin, pile, and burn in riparian areas and mechanical harvest units to reduce ladder fuels
- 2,040 acres of underburning following mechanical treatments to reduce surface fuels.

Table 2-1. Alternative D: Thin from Below and Variable Density (Radial) Thinning Treatments.

Prescription	Diameter Limit (inch)	Canopy Cover (percent)	Acres
Thin from Below	30	40–50	76
Variable Density	20, 24, and 30	40, 40–50, and 50–60	859
Total			935

2.1.7.2 Watershed Improvements

Approximately 0.7 mile of non-system road would be proposed for decommissioning upon project completion and an estimated 9.8 miles of non-system roads would be obliterated to reduce sedimentation. There are 3.6 miles of road reconstruction that would occur solely to improve drainage infrastructure to reduce downstream sedimentation.

Roads that are to remain open but are improperly constructed or unmaintained would be improved. Treatments range from light brushing with no drainage improvements to heavy brushing and large drainage improvements (figure 2-5). Drainage improvements may include: out sloping road segments, installing armored rolling dips, or replacing culverts. Rolling dips, which would likely be one of the most commonly prescribed road improvements for the Sugarloaf Project, are generally installed at a frequency of 1–4 dips per mile of road. This estimate may vary depending on the existing condition of the road drainage system and the number of stream crossings present. Each dip would be approximately 15 feet long and as wide as the existing road surface. Placement of dips to sufficiently disconnect the road drainage system from nearby stream channels would be determined by District watershed staff. Roads were selected for improvement (maintenance or reconstruction) based on planned future use for resource management and recreational activities, and threat posed to watershed values due to erosion and sedimentation.

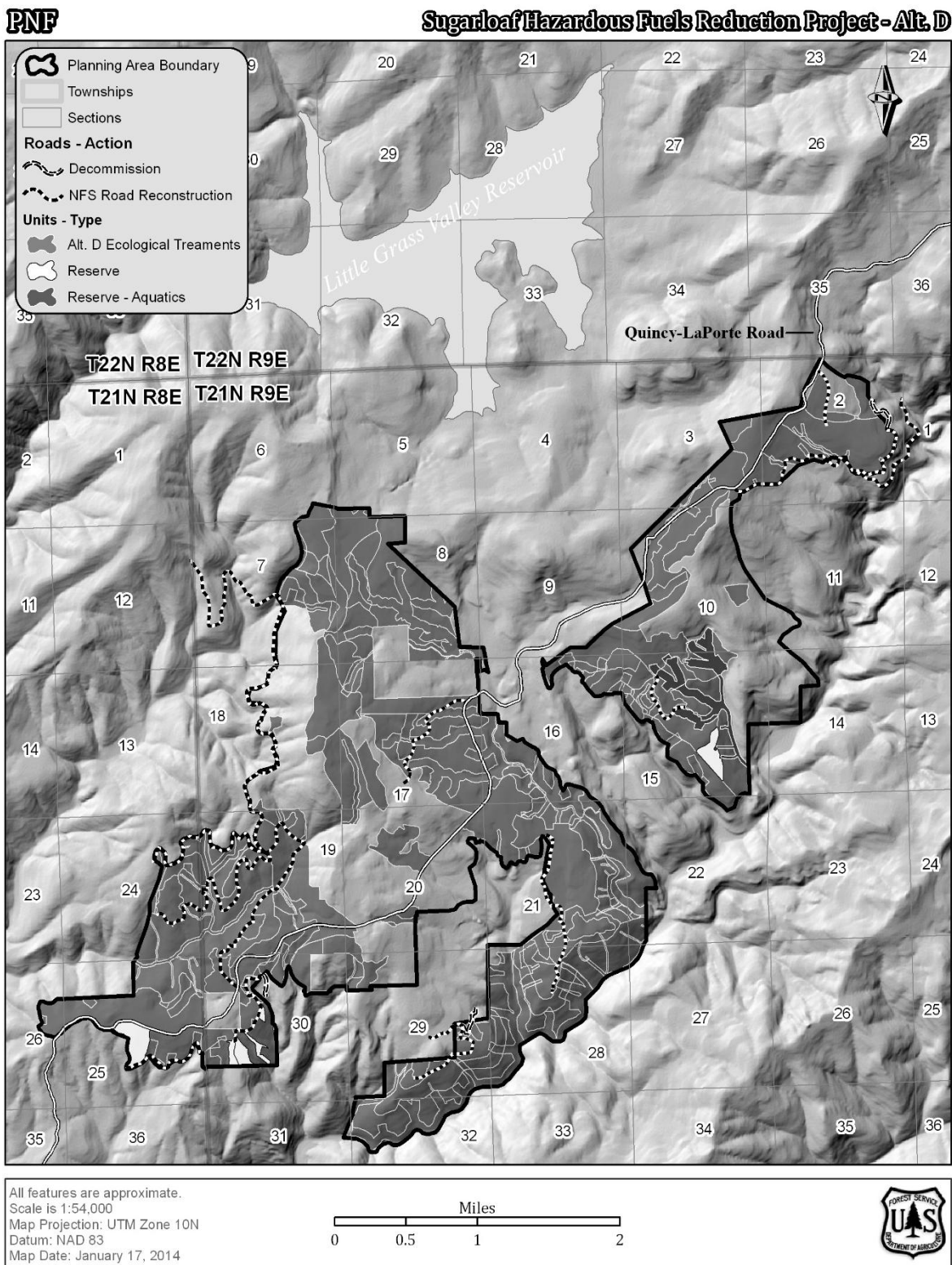


Figure 2-5. Alternative D – Proposed Treatments on NFS lands.

2.1.8 Alternative B (Herger-Feinstein Quincy Library Group Pilot Project)

On September 30, 2012, the 2008 *Consolidated Appropriations Act* authorities to implement the HFQLG Act and applicable standards and guidelines underlying the design of Alternative B ended. Alternative B was considered and analyzed in detail requiring a non-significant Forest Plan amendment (refer to section 1.7). Alternative B was designed to test and demonstrate the effectiveness of *HFQLG Forest Recovery Act* pilot fuels, vegetation and riparian restoration activities in meeting ecologic, economic, and fuel reduction objectives (see figure 2-6).

The proposed treatments comply with the standards and guidelines in Table 2 in the 2004 SNFPA ROD; specific to prohibition of mechanical treatments restrictions in Protection Activity Centers (PACs), delineation of riparian habitat conservation areas (RHCAs), Group Selection treatments (creating forest gaps up to 2.0 acres in size), tree removal mandates of minimum retention percentages for basal area and canopy cover in size classes CWHR 4M, 4D, 5M, and 5D.

Alternative B would establish new defensible fuel profile zones (DFPZ) to fill in gaps in the partially completed DFPZ network to reduce risks to life, property, rare habitats and to recover watershed resources from wildfire. Group Selection (GS) treatments (up to 2 acre forest gaps) would promote shade intolerant tree species (oak and pine) and provide wood products. Alternative B would generate an estimated 5.8 million board feet of timber to off-set some of the cost of operations. This alternative would provide an estimated 152 forestry jobs associated with implementation.

Alternative B responds to the relevant issue for cumulative watershed effects (CWE) incorporating identical road-related watershed restoration activities as Alternative D. Watershed restoration activities target roads and trails that are intercepting, diverting or disrupting natural surface water flow paths near streams that require drainage infrastructure upgrades to restore flow connectivity as listed below; designed to improve watershed health:

- Obliterating 8.8 miles of non-system (unclassified) roads outside the Valley Creek Special Interest Area (SIA);
- Obliterating 1.0 mile of non-system (unclassified) road within the Valley Creek SIA;
- Decommissioning 0.7 mile of NFS (classified) road; and,
- Redesigning and upgrading road drainage features along priority NFS roads PC511A, 22N53, 21N18A and 21N42Y such as out-sloping road segments, installing armored rolling dips and replacing culverts.

Alternative B, unique from Alternatives C and D, applies standard riparian habitat conversation areas (RHCAs) no treatment or exclusion buffer widths as follows:

- *Groups Selection, Mechanical Thinning and Radial Thinning:* Maintain standard RHCAs. These treatments by mechanical equipment would not occur within the full width of RHCAs, 150 feet for non-fish bearing and 300 feet for fish bearing on each side of stream.

- *Mastication*: Apply a 25 foot buffer for SMZs, a 50 foot buffer for all non-fish bearing streams and a 75 foot buffer for fish bearing streams.
- *Handcut/Pile/Burn (HCPB)*: No buffer on ephemeral streams, but retain at least 50 percent canopy cover and all riparian vegetation post treatment. Piles should be at least 25 feet from edge of stream. Apply a 25 foot buffer to all other non-fish bearing streams and a 50 foot buffer to fish bearing streams.
- *Handcut/Grapple Pile (HCGP)*: Apply a 50 foot buffer for ephemeral streams, 75 feet for all other non-fish bearing and 100 feet for fish bearing streams.
- *Underburns (UB)*: Use RHCA widths, but buffer is not a no-treatment buffer. Fire ignition would be prohibited within the buffer, but would be allowed to back into the buffer.

Alternative B uniquely applies Group Selection (GS) treatments, positioned away from LaPorte and American House and drainages subject to prevailing winds with potential to funnel flames toward residential properties. Forest openings (GS) would be established up to a 2.0 acres in size. The IDT limited the application of GSs near private property, because plantations associated with GS represent fuel hazards during a wildfire. These areas are instead proposed for mastication, hand cut, pile and burn and/or underburn. The areas identified as being at or below basal area and canopy cover retention standards were eliminated from further consideration for Group Selection.

Alternative B would apply area thinning on south-facing slopes in the WUI defense zone and along ridgetops and upper slopes, allowing for removal of trees up to 30 inch dbh while retaining a minimum 40 percent canopy cover. Forest canopy cover retention would average 40 percent canopy cover, increasing to 40–50 percent on north aspects; allowing for removal of trees up to 30 inches dbh. The lower slopes and Riparian Conservation Areas (RCAs) would be maintained at 40–50 percent canopy cover using variable thinning methods, allowing for removal of trees up to 30 inches dbh, outside restricted riparian buffers.

Treatments proposed with the Valley Creek Special Interest Area (SIA) and spatially overlapping NOGO and CSO PACs would not exceed 5 percent per year or 10 percent per decade, and would be limited to prescribed underburning. Manual hand cutting of small trees and shrubs is limited to 250 feet either side of main road access routes; retaining a minimum of 50 percent canopy cover.

Under Alternative B, treatment prescriptions would include:

- 992 acres of mechanical DFPZ thinning with 763 acres of variable density thinning and 229 acres of area thinning of trees less than 30 inches dbh, retaining 40–50 percent forest canopy cover, utilizing ground-based and skyline logging systems. Trees greater than 10 inches dbh would be removed as sawlogs. Harvest treatments will reduce tree density and provide separation of canopy fuels.
- 71 acres of group selection (GS);
- 223 acres of mastication to reduce tree density and ladder fuels.
- 375 acres of hand thin, pile, and burn to reduce tree density and ladder and surface fuels.

- 4.9 miles of NFS road reconstruction, 4.3 miles of temporary road construction and 31 landings.
- 1,989 acres of underburning to reduce ladder and surface fuels.

Treatment to reduce ladder fuels in riparian and mechanical harvest units will take place within two years post mechanical harvest. Prescribed underburning generally takes place one to five years following mechanical treatment.

- 308 acres of hand thin, pile, and burn in riparian areas within mechanical harvest units to reduce ladder and surface fuels.
- 1,930 acres of follow up underburning post mechanical treatment to reduce surface fuels.

2.1.8.1 Watershed Improvements

Approximately 0.7 mile of non-system road, would be proposed for decommissioning upon project completion and an estimated 9.8 miles of non-system roads would be obliterated to reduce sedimentation. Roads that are to remain open but are improperly constructed or unmaintained would be improved. Treatments range from light brushing with no drainage improvements to heavy brushing and large drainage improvements. Drainage improvements may include: out sloping road segments, installing armored rolling dips, or replacing culverts. Rolling dips, which would likely be one of the most commonly prescribed road improvements for the Sugarloaf Project, are generally installed at a frequency of 1–4 dips per mile of road. This estimate may vary depending on the existing condition of the road drainage system and the number of stream crossings present. Each dip would be approximately 15 feet long and as wide as the existing road surface. Placement of dips to sufficiently disconnect the road drainage system from nearby stream channels would be determined by District watershed staff. Roads were selected for improvement (maintenance or reconstruction) based on planned future use for resource management and recreational activities, and threat posed to watershed values due to erosion and sedimentation.

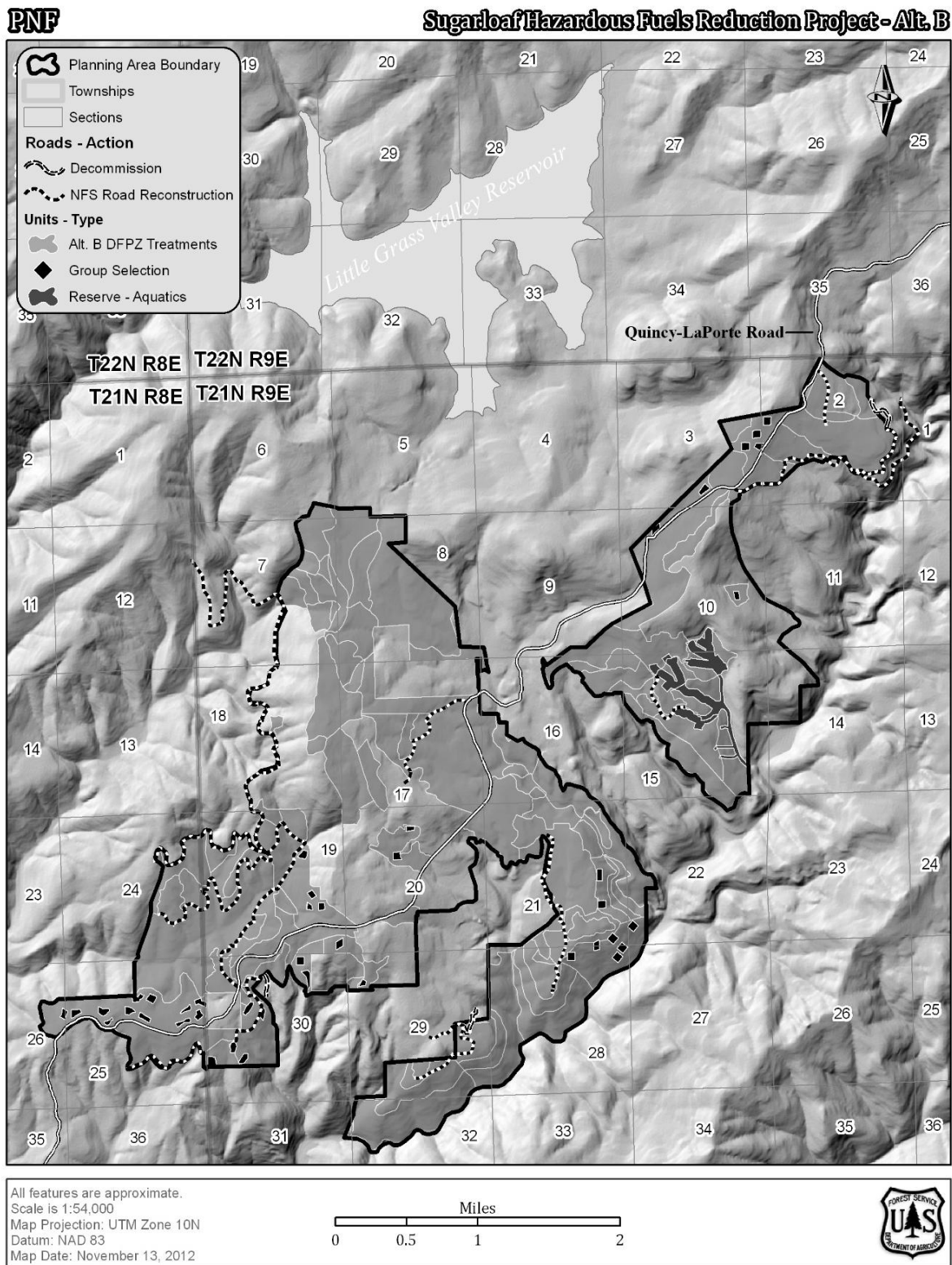


Figure 2-6. Alternative B - Proposed Treatments on NFS lands.

2.1.9 Alternative C - Hazardous Fuels Reduction

Alternative C establishes fuel treatments for the purpose and need of modifying fire behavior at a landscape scale. Alternative C designed to apply more intensive mechanical thin from below treatments along ridgetops and adjacent to private development in LaPorte, American House and surrounding dispersed private inholdings. This alternative, similar to alternative D, was designed within the framework of land management direction in the Plumas National Forest Land and Resource Management Plan (PNF LRMP) (USDA 1988) as amended by the Sierra Nevada Forest Plan Amendment Final Supplemental EIS (SNFPA FSEIS) and Record of Decision (ROD) (USDA 2004a, 2004b) (see figure 2-7).

Alternative C is expected to produce 5.3 million board feet of commercially-valuable timber volume and an estimated 186 forestry jobs associated with implementation. Operations would require 3.5 miles of NFS classified road reconstruction, 2.8 miles of unclassified road construction (closed post operations) and the construction of 21 new landing sites. In order to mitigate unavoidable short-term operational impacts to water quality from ground disturbing activities such as logging and prescribed burning, portions of National Forest System (NFS) roads PC511A, 22N53, 21N18A and 21N42Y would be redesigned to improve (upgrade) road drainage features such as out sloping road segments, installing armored rolling dips and replacing culverts.

Alternative C, identical to alternative D, proposes treatments within standard RCA no treatment or exclusion buffer widths as follows:

- *Mastication*: Apply a 75 foot buffer for all perennial streams. Apply a 25 foot equipment exclusion zone buffer for ephemeral streams without annual scour. Apply a 50 foot equipment exclusion zone buffer for all ephemeral streams with annual scour, and intermittent, and perennial streams that do not have fish. Apply a 75 foot buffer on all intermittent and perennial streams that have fish. Note: if SNYLFs are found prior to implementation the 25 foot equipment exclusion zone on intermittent streams would be increased from 75 feet up to 300 feet.
- *Mechanical thinning*: Apply a 50 foot equipment exclusion zone buffer for ephemeral streams without annual scour. Apply a 150 foot equipment exclusion zone buffer for all ephemeral streams with annual scour, intermittent, and perennial streams that do not have fish. Apply a 300 foot buffer on all intermittent and perennial streams that have fish.
- *Handcut/Pile/Burn (HCPB)*: No buffer on ephemeral streams, but retain at least 50 percent canopy cover and all riparian vegetation post treatment. Piles should be at least 25 feet from edge of stream. Apply a 25 foot buffer to all intermittent and perennial streams that do not have fish. Apply a 50 foot buffer to intermittent and perennial streams that do have fish. No HCPB treatment will occur within these buffers except for in ephemerals. If SNYLFs are found prior to implementation the no treatment buffer would be set to 75 feet;(up to 300 feet) regardless of the stream type (applies to all action alternatives).

- *Handcut/Grapple Pile (HCGP)*: Apply a 50 foot equipment exclusion buffer for ephemeral streams. Intermittent and perennial streams that do not have fish will have a 75 foot buffer. Apply a 100 foot equipment exclusion buffer for intermittent and perennial streams that do have fish. If SNYLFs are found prior to implementation then an additional LOP will apply within a mile of SNYLFs detection (applies to all action alternatives).
- *Underburning (UB)*: Fire ignition would be prohibited within the buffer, but would be allowed to back into the buffer; exception is aquatic reserves to protect known rare aquatic populations where no UB is allowed within 300 feet either side of the stream channel.

Under Alternative C, the fuel treatments would be established by applying the following prescriptions:

- 1,315 acres of mechanical thin from below of trees less than 30 inches dbh , retaining 40 percent forest canopy cover on south and west facing slopes, and 50 percent on north and east facing slopes, utilizing ground-based and skyline logging systems; allowing for scattered 1/2 acre forest openings. Trees greater than 10.0 inches dbh would be removed as sawlogs. Mechanical thinning will reduce tree density and provide canopy separation.
- 1,026 acres of hand thin, pile, and pile burn trees less than 10 inches dbh to reduce tree density and ladder and surface fuels.
- 334 acres of masticating brush and trees less than 10 inches dbh to reduce tree density and ladder fuels. Remaining conifers and brush will have an 18–25 foot spacing and retain all hardwoods will be retained except where removal is required for operability.
- 91 acres of hand thin, grapple pile, and burn to reduce ladder and surface fuels.
- 3.5 miles of NFS road reconstruction, 2.8 miles of temporary road construction and 21 new landings).
- 1,989 acres low to moderate intensity prescribed underburn, including 331 acres in the Valley Creek Special Interest Area (SIA) to reduce surface fuels.

Treatment to reduce ladder fuels in riparian and mechanical harvest units will generally take place within one to two years post mechanical harvest. Hand cut treatment following mastication will be determined by timing and amount of regrown of brush, which will be monitored three to five years post mastication. Prescribed underburning generally takes place one to five years following mechanical treatment.

- 516 acres of follow-up hand thin, pile, and burn in riparian and mechanical harvest and mastication units to reduce ladder and surface fuels.
- 2,560 acres of underburning following mechanical treatments to reduce surface fuels.

Table 2-2. Alternative C: Fuel Treatments –Thin from Below

Rx	Diameter Limit	Canopy Cover	Non-RHCA
Thin from Below	30 inches	40 percent	969 acres
Thin from Below	30 inches	50 percent	346 acres
		Total	1,315 acres

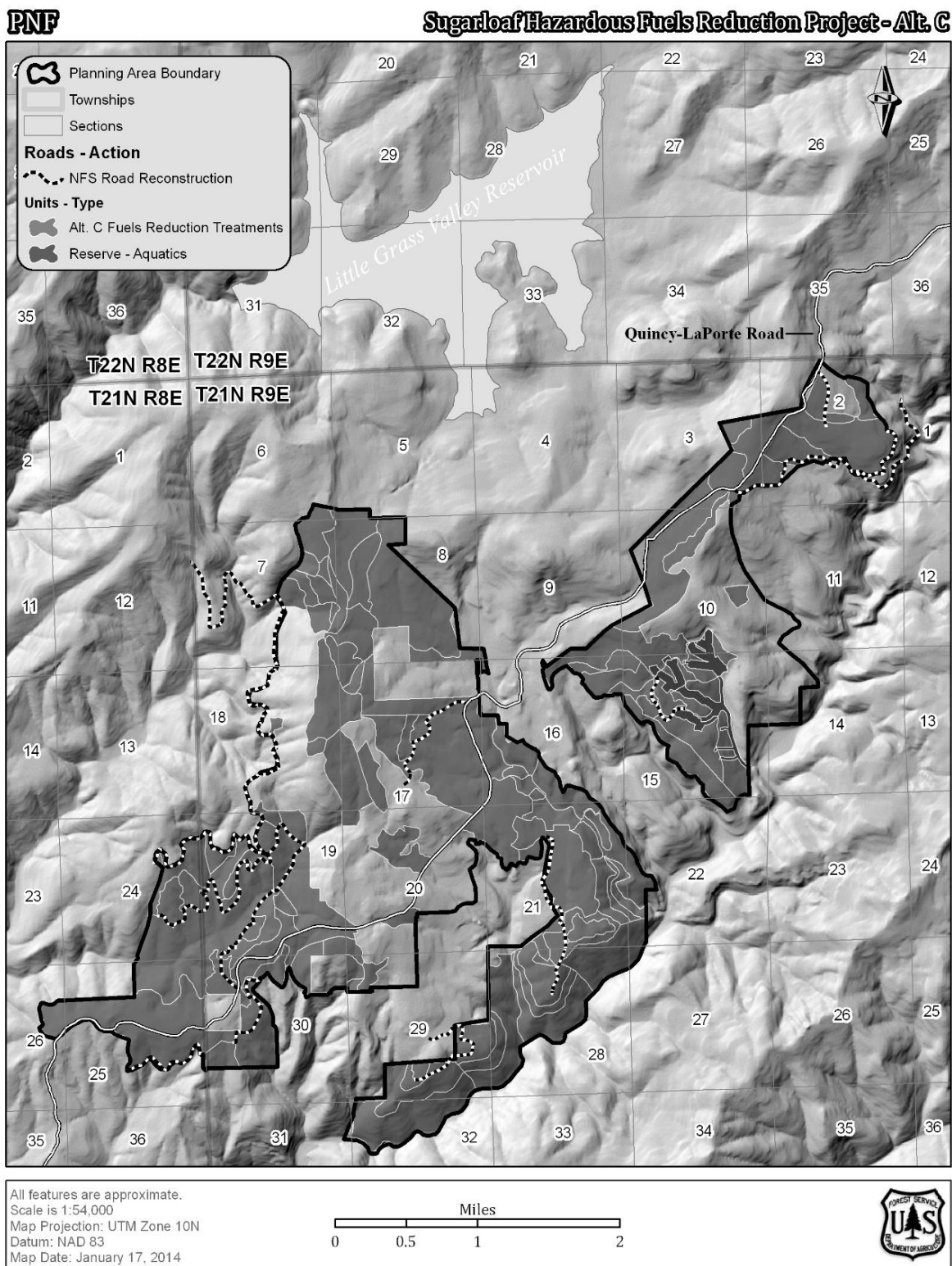


Figure 2-7. Alternative C – Proposed Treatments on NFS lands.

2.2 Design Criteria and Mitigations Common to All Action Alternatives

This section presents a series of tables (tables 2-3 through 2-9) that contain the design criteria and mitigation measures for actions being proposed over the next decade aimed at:

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or environments.
- Rectifying the impact by repairing, rehabilitating or restoring the affected environment.

The design criteria and relevant, reasonable mitigation measures, as defined in the CEQ Regulations (40 CFR 1508.20), apply to the proposed treatments so effects are minor and/or non-variable. Further discussion of Best Management Practices and standard operating practices applied to mitigate adverse effects is provided in appendix A.

Table 2-3. Design Criteria and Mitigation Measures applicable to variable density thinning and area thinning treatments.

Actions	Design Criterion
Ground-based Harvesting and Yarding	<p>Mechanical harvesting and whole-tree yarding would be used to remove commercial sawlog and biomass trees. Trees greater than or equal to 10.0 inches dbh would be removed as sawlog product and trees less than 10.0 inches dbh would be removed as biomass product. Tops and limbs would be yarded to the landing and removed as a product.</p> <p>Ground-based equipment would be restricted to slopes less than 35 percent. Exceptions may be made for short pitches (less than 100 feet) within the interior of units where slopes exceed these limits. When units have inaccessibly steep inclusions of steeper ground the sawlog products may be end-lined.</p> <p>Modify thinning when unit is within 100 feet of LaPorte Rd., private homes and the town of LaPorte. Restrict landing locations and temporary roads so that they will be unseen or undetectable by placing at least 100 feet off roadways, constructing parallel to the main roadway, by placement uphill or downhill from line of sight and maintaining vegetation within the 100 foot buffer. Obliterate landings and temporary roads by restoring to natural condition. Locate skid trails parallel to the roadway and at least 100 feet from the main road</p> <p>Mitigate slash by piling and burning; minimize rutting, hummocks and soil surface disturbances by minimizing equipment movement, turns and other actions. Restore surfaces to natural condition where ruts and hummocks have been created.</p>
Skyline Harvesting and Yarding	<p>Whole-tree yarding would be used to remove commercial sawlog and biomass trees. Trees greater than or equal to 10.0 inches dbh would be removed as a sawlog product.</p> <p>Skyline yarding would require one end suspension with full suspension over intermittent and perennial streams. The corridor would not be wider than 20 feet. The width for lateral yarding to the skyline corridor would be 75 feet on either side of the mainline. Lateral yarding would not require lift. When there are short inclusions of side hill within the corridor, allow side hill yarding.</p> <p>The top 100 feet of the skyline corridor would be rehabilitated with weed-free straw mulch and native seed, following recontouring and restoration of surface disturbance.</p>

Actions	Design Criterion
Log Decks	All decks shall be located at least 100 feet off LaPorte Rd., away from private homes and the town of LaPorte. Cull white-fir and pine trees shall be left in the woods. Oak and incense cedar are to be yarded to a deck; preferably sold as firewood..
Residual species preference	<p>Retain the largest, most vigorous dominant and codominant trees to create a residual stand that would be comprised of larger fire-resilient trees. Species preference would be determined by forest type. In general, prefer to retain shade-intolerant species including rust-resistant sugar pine, black oak, ponderosa and Jefferey pine, and large Douglas-fir.</p> <p>Retain largest specimen tree species within 100 feet of LaPorte Road, private homes, and town of LaPorte. Mark only take trees, and put the mark on the unseen side of the tree.</p>
Residual surface fuels	<p>Maintain adequate cover of surface fuels, litter, duff, and large woody debris to maintain habitat values, reduce potential erosion, and meet soil standards for woody debris and ground cover.</p> <p>Retain surface fuels (less than 3 inches diameter) at a level that would result in projected flame lengths of less than 4 feet under 90th percentile weather conditions. This generally corresponds to approximately 5 tons or less of surface fuels per acre.</p> <p>Retain large woody debris (greater than 12 inches diameter), where they exist, at 10 to 15 tons per acre of the largest down logs. Where needed, jackpot burn, or machine pile and burn extensive areas of deadfall, where feasible in terms of equipment operability and reduced chance of excessive scorch-related mortality upon burning of these piles.</p> <p>Based on post treatment evaluations, underburn, jackpot burn, machine pile and burn, and/or hand pile and burn to treat natural and activity-generated fuels.</p>
Snag retention	Retain the number of snags per acre appropriate for each forest type unless removal is required to allow for operability. In Sierra mixed conifer types and ponderosa pine forest types, retain four to six of the largest snags per acre. Snags larger than 15 inches dbh and 20 feet in height would be used to meet this guideline.
Fireline	Construct firelines using hand crews or mechanical equipment, as needed, around areas to be underburned, and around machine piles or hand piles. Incorporate existing roads, landings, skid trails, rock fields, bare areas, and other features into containment lines where logical and feasible.
Treatment of Stumps	<p>All stumps 14 inches and greater in diameter would be treated with borax within one day of cutting, to prevent the introduction and spread of <i>Heterobasidion</i> root disease for select units.</p> <p>Cut stumps along LaPorte Rd., private property and the town of LaPorte no taller than 12 inches above the surface and cut stumps at a slope facing away from the line of sight.</p>

Table 2-4. Design Criteria for Group Selections – Alternative B only.

Criterion	Actions
Group Selection size	Group Selection will be 0.5 acre to 2.0 acres; irregular shape.
Group Selection location	<p>Group selections would primarily be located in CWHR size class 4 stands (average dbh of 11 to 24 inches); target locations where insect, disease, simplified tree species composition and/or declining tree vigor is evident. Locate outside Riparian Habitat Conservation Areas.</p> <p>Locate group selection units at least 100 feet away from the LaPorte Rd., private homes and the town of LaPorte while maintaining a vegetative buffer between visually evident operations and the sensitive viewshed; unique to topographic position, slope gradient and proximity to public infrastrucutres and main access routes.</p>
Ground-based Harvesting and Yarding	<p>Mechanical harvesting and whole-tree yarding would be used to remove commercial sawlog and biomass trees. Trees greater than or equal to 10 inches dbh would be removed as sawlog product and trees less than 10 inches dbh would be removed as biomass product.</p> <p>Ground-based equipment would be restricted to slopes less than 35 percent. Exceptions may be made for short pitches (less than 100 feet) within the interior of units where slopes exceed these limits. When units have inaccessibly steep inclusions of steeper ground, sawlog and biomass products may be end-lined.</p> <p>Restrict landing locations and temporary roads so that they will be unseen or undetectable by placing at least 100 feet off roadways, constructing parallel to the main roadway, by placement uphill or downhill from line of sight and maintaining vegetation within the 100 foot buffer. Obliterate landings and temporary roads by restoring to natural condition.</p> <p>Locate skid trails parallel to the roadway and at least 100 feet from the main road.</p> <p>Mitigate slash by piling and burning; minimize rutting, hummocks and soil surface disturbances by minimizing equipment movement, turns and other actions. Restore surfaces to natural condition where ruts and hummocks have been created.</p>
Skyline Harvesting and Yarding	<p>Whole-tree yarding would be used to remove commercial sawlog trees greater than or equal to 10 inches dbh. Tops and limbs may be yarded to the landing or handpiled and pile burned.</p> <p>Skyline yarding would require one end suspension with full suspension over intermittent and perennial streams. The corridor would not be wider than 20 feet. The width for lateral yarding to the skyline corridor would be 75 feet on either side of the mainline. Lateral yarding would not require lift. Side-hill setups would not be allowed.</p> <p>The top 100 feet of the skyline corridor would be rehabilitated with weed-free straw mulch and native seed, following recontouring and restoration of surface disturbance.</p>
Diameter constraints	All trees greater than or equal to 30 inches dbh would be retained, except where removal is required to allow for operability. Minimize damage to trees greater than or equal to 30 inches dbh as much as practicable.
Log Decks	All decks shall be located at least 100 feet off LaPorte Rd., away from private homes and the town of LaPorte. Cull trees shall be left in the wood and are not to be yarded to a deck.
Slash treatment / Site Preparation	Based on post treatment evaluations, underburn, jackpot burn, machine pile and burn, and/or hand pile and burn, to treat natural and activity generated fuels, and shrubs.
Regeneration strategy	Regenerate groups with native shade-intolerant conifers, indicative of the ecological habitat type in which the group is located, using a combination of natural and planted seedlings to achieve desired stocking levels. Plantation performance would be monitored after the 1st and 3rd years, and regeneration actions would be undertaken, if needed, to ensure successful regeneration within five years after harvest. Control competing brush and grass by grubbing or mastication, if necessary, to assure survival and growth of conifers.

Criterion	Actions
Residual species preference	Retain all sugar pine tagged as resistant to white pine blister rust. Where black oak is present, retain black oaks greater than or equal to 3 inches dbh.
Residual surface fuels	<p>Maintain adequate cover of surface fuels, litter, duff, and large woody debris to maintain habitat values, reduce potential erosion, and meet soil standards for woody debris and ground cover.</p> <p>Retain surface fuels (less than 12 inches diameter) at a level that would result in projected flame lengths of less than 4 feet under 90th percentile weather conditions. This generally corresponds to approximately 5 tons or less of surface fuels per acre.</p> <p>Retain Large Woody debris (greater than 12 inches diameter): Where they exist, retain 10 to 15 tons per acre of the largest down logs. Where needed, machine pile and burn extensive areas of deadfall, where feasible, in terms of equipment operability and reduced chance of excessive scorch-related mortality upon burning of these piles.</p>
Snag retention	Retain two of the largest snags per acre exceeding 15 inches dbh and 20 feet tall, unless removal is required to allow for operability.
Fireline	Construct firelines using hand crews or mechanical equipment around groups to be underburned and around machine piles or hand piles, as needed. Incorporate existing roads, landings, skid trails, rock fields, bare areas, and other features into containment lines where logical and feasible.
Treatment of Stumps	All stumps 14 inches and greater in diameter would be treated with borax within a day of cutting, to prevent the introduction and spread of <i>Heterobasidion</i> root disease for select units.

Table 2-5. Design Criteria for RHCAs and RCAs.

Criterion	Actions
RHCA and RCA Equipment constraints	<p>Riparian Habitat Conservation Areas (RHCAs): Overall widths, per Scientific Analysis Team (SAT) guidelines, are 150 feet for non-fish bearing and 300 feet for fish bearing on each side of stream.</p> <p>The following buffers by treatments apply to RHCAs, unless otherwise specified below.</p> <p>All buffers are no-treatment buffers, unless specified otherwise.</p> <p>Buffers smaller than RHCAs are prescribed for treatments on slopes less than or equal to 35%. These buffers are doubled for slopes greater than 35% and where special aquatic concerns exist.</p> <p>Riparian Conservation Areas (RCAs): Overall widths, per the 2004 SNFPA FSEIS, are 300 feet for perennial and 150 feet for seasonally flowing streams for all alternatives.</p> <p>Groups Selection, Mechanical Thinning and Area Thinning: Maintain standard RHCAs. These treatments by mechanical equipment would not occur within the full width of RHCAs. Only applies to Alternative B.</p> <p>Mechanical Thinning and Radial Thinning: No Treatment within 150 feet for non-fish bearing and 300 feet for fish bearing on each side of stream.</p> <p>Mastication: Apply a 25 foot buffer for SMZs, a 50 foot buffer for all non-fish bearing streams and a 75 foot buffer for fish bearing streams. Applies to all the action alternatives.</p> <p>Handcut/Pile/Burn (HCPB): No buffer on ephemeral streams, but retain at least 50% canopy cover and all riparian vegetation post treatment. Piles should be at least 25 feet from edge of stream. Apply a 25 feet buffer to all other non-fish bearing streams and a 50 foot buffer to fish bearing streams. Locate burn piles away from riparian vegetation to reduce the potential for scorch where feasible. Applies to all the action alternatives.</p>

Criterion	Actions
	<p>Handcut/Grapple Pile (HCGP): Retain 50 foot buffer for ephemeral streams, 75 feet for all other non-fish bearing and 100 feet for fish bearing streams.</p> <p>Underburns (UB): Ignite prescribed fire outside Fire ignition would be prohibited within the buffer, but would be allowed to back into the buffer; exception is aquatic reserves to protect known rare aquatic populations where no UB is allowed within 300 feet either side of the stream channel.</p>
Diameter constraints	Within mechanical harvest areas, implement a 20-inch upper diameter limit, except where needed for operability. Minimize damage to trees larger than 20 inches dbh as much as practicable. In equipment exclusion zones, implement an 9-inch upper diameter limit on hand thinning treatments.
Residual species preference	Where present, retain all hardwood and riparian species. Retain the largest, most vigorous dominant and codominant trees to create a residual stand that would be comprised of larger fire-resilient trees. Species preference would be determined by forest type. In general, prefer to retain shade-intolerant species including rust-resistant sugar pine, black oak, ponderosa and Jefferey pine, and large Douglas-fir.
Snag retention	Retain the number of snags per acre appropriate for each forest type unless removal is required to allow for operability. In Sierra mixed conifer types and ponderosa pine forest types, retain four of the largest snags per acre. In the red fir forest type, retain 6 of the largest snags per acre. Snags larger than 15 inches dbh and 20 feet in height would be used to meet this guideline.
Fireline	Construct firelines using hand crews around areas to be underburned or pile burned, as needed; incorporate existing roads, landings, skid trails, rock fields, bare areas, and other features into containment lines where logical and feasible.
Residual surface fuels	<p>Maintain adequate cover of surface fuels, litter, duff, and large woody debris to maintain habitat values, reduce potential erosion, and meet soil standards for woody debris and ground cover.</p> <p>Retain surface fuels (less than 12 inches diameter) at a level that would result in projected flame lengths of less than 4 feet under 90th percentile weather conditions. This generally corresponds to approximately 5 tons or less of surface fuels per acre.</p> <p>Retain Large Woody debris (greater than 12 inches diameter): Where they exist, retain 10 to 15 tons per acre of the largest down logs. Where needed, machine pile and burn extensive areas of deadfall, where feasible, in terms of equipment operability and reduced chance of excessive scorch-related mortality upon burning of these piles.</p>

Table 2-6. Design Criteria for Effective Soil Cover for All Treatment Types if Cover is Not Met.

Erosion Hazard Rating (EHR)	Percent Effective Soil Cover	Design Feature
Low-Moderate	50%	Units that do not meet effective soil cover post-treatment would have to spread weed-free straw on bare soil areas until the project standard for effective soil cover is met. Concentrate spreading weed-free straw on bare areas larger than 25 square feet first. The minimum thickness will have to be 0.5 inches to count as effective soil cover.
High	60%	

Table 2-7. Design Criteria for Access and Transportation.

Criterion	Actions
Non-system roads	Construct approximately 4.3 miles of new temporary (non-system) roads followed by decommissioning (obliteration) post implementation, including restoring the soil

Criterion	Actions
	surface to natural grade.
Harvest landings	<p>Landings would be utilized to remove sawlog and biomass products. The Sugarloaf Project is planned to accommodate product removal with one landing per 40 acres. Per FSH 2409.15, a project should have no more than one landing per 20 acres except when there is a need for more landings to limit resource protection problems.</p> <p>Existing landings shall be reconstructed and utilized considering the location and effects to resources. Would construct new landings where existing landings are not present or are inadequate due to the location and effects to resources. Number and location of landings would be subject to agreement and would conform to direction as specified in FSH 2409.15, SMRs and BMPs.</p> <p>For existing landings supporting cull decks, identify and relocate individual hollow log structures prior to cull deck construction. Relocate hollow logs to forest stand outside of landing disturbance area.</p> <p>Landing spacing for skyline units would be 150 feet. Skyline units may require more landings in order to facilitate operations.</p> <p>Removal of green trees would occur to allow for temporary non-system road and landing construction.</p> <p>All landings and the last 200 feet of main skids leading to the landings will be reseeded with three species of native grasses post-treatment. The species of native grasses that will be used are Blue Wild Rye (<i>Elymus elaeagnus</i>), California Brome (<i>Bromus carinatus</i>) and Orcutt's Brome (<i>Bromus orcuttianus</i>).</p>

NOTE:

a. Road treatments are planned and would be implemented in accordance with the PNF LRMP (USDA 1988) and the Plumas National Forest Public Motorized Travel Management FEIS (USDA 2010a) and ROD (USDA 2010b).

Table 2-8. Design Criteria for Watershed Improvements.

Criterion	Actions
NFS road improvement	Treatments range from light brushing with no drainage improvements to heavy brushing and large drainage improvements. Drainage improvements may include: outslowing road segments, installing armored rolling dips, or replacing culverts. Four priority roads within the project area (PC511A, 22N53, 21N18A, and 21N42Y), with a combined length of about 4.9 miles, are proposed to be reconstructed and improved with additional cross-drains to address current water quality concerns.
NFS road decommissioning	Decommission approximately 0.7 miles of NFS road. Approximately less than 0.3 miles of road at the end of 22N53, and the entire road lengths of 21N18G and 21N62Y.
Non-system road Obliteration	Obliterate approximately 9.8 miles of non-system roads.

Note:

a. Road treatments are planned and would be implemented in accordance with the PNF LRMP (USDA 1988) and the Plumas National Forest Public Motorized Travel Management FEIS (USDA 2010a) and ROD (USDA 2010b). Watershed improvements are **not** proposed under alternative C.

Table 2-9. Design Criteria for Minerals Resources.

Project Design Features and Constraints for Projects Planned in Areas Where Mining Claims Exist
Protect mining claim corner markers and discovery markers. (This does not apply to signs attached to trees.) Monuments are usually a wooden 4 × 4 post or a PVC pipe, often with rocks piled up around the base. However, a wide variety of variations can be found.

Claim signs attached to trees (marked for removal) should be removed from the tree and turned in to the Minerals staff, so the signs may be returned to the claimant. The location of the sign should be noted when turning it in to the Minerals staff.
Plan ground based project activities so as not to interfere with active mining operations.
The time between document input and project implementation may be a few months or a few years. Because mining claims can be dropped or new claims filed at any time, a letter to new claimants may be required to allow coordination of the timing of activities.

2.2.1 Alternatives Considered but Eliminated from Detailed Study

Federal agencies are required by NEPA to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14).

2.2.1.1 Goats as a management tool

A public comment was submitted to the Forest Service to consider working with goats as a means for achieving treatment objectives proposed for the project, referring to the grazing hand book for direction. This alternative was eliminated from detail study as the use of animals was not considered a feasible management tool due to the current vegetative conditions and landscape scale of the project.

Although goats have been found to be an effective tool at small scales to maintain desired vegetative (fuel) conditions, once primary mechanical fuels reduction treatment are completed, the current existing height and age of the brush species within the project area makes it unavailable or unpalatable as forage (i.e., deer brush, white thorn, manzanita, etc.) greater than 2 feet in height and remove excess conifer (i.e., incense cedar, white fir, etc.) and hardwood (i.e., tanoak, live oak, etc.) trees up to 9.9 inches dbh.

On the Cleveland National Forest, about 1,400 animals were used for a 100-acre fuels reduction project on an existing fuel break in May 2013. The goats were contained inside a portable electric fence, surrounding two or three acres moved every few days until desired conditions are achieved; operational cost ranged from \$400 to \$500 per acre. Monitoring indicates 1,400 animals are capable of reducing 100-acres to low lying vegetation per month

(<http://m.utsandiego.com/news/2013/may/11/goats-forest-cleveland-holes-graze/> and <http://blogs.usda.gov/2013/06/19/goats-grazing-for-fuels-reduction-on-the-cleveland-national-forest/>).

2.2.2 Comparison of Alternatives

The comparison of alternatives focuses on objectives and issues that provide measureable elements to the proposed action and emphasize the most important environmental effects. These are elements of the ecosystem that can be measured to indicate an increase or decrease in trends in ecological health. To compare these elements, measurement indicators were developed to show the differences between the alternatives and provide a clear basis for the decision to be made by the Responsible Official.

The measurement indicators are used in the analysis to quantify and describe how well the proposed action and alternatives meet the project objectives. Figure 2-10 displays acres of treatment

for each alternative. Table 2-10 shows the difference between all alternatives by using measurement indicators, organized by elements of the purpose and need.

Table 2-10. Comparison of Alternatives Considered in Detail – Proposed Treatment Methods.

Alternative A	Alternative B	Alternative C	Alternative D (Proposed Action)
<p>No Proposed Activities</p> <p>The No-action alternative provides a baseline against which to compare the other alternatives.</p>	<p>Alternative B is designed to be consistent with the HFQLG Act standards and guidelines; assumes legislative extension prior to decision.</p> <p>Wood by-products from these treatments are expected to produce 5.8 million board feet of commercially-valuable timber volume</p> <ul style="list-style-type: none"> • 992 acres of DFPZ thinning with 763 acres of variable density thinning and 229 acres of area thinning (83 acres skyline logging) • 71 acres of group selection (GS). <p>Timber harvest operations require 4.9 miles of NFS classified road reconstruction, 4.3 miles of unclassified (temporary) road construction (closed post operations) and the construction of</p> <ul style="list-style-type: none"> • 31 new log landing sites • 223 acres of mastication • 683 acres of hand thin, pile, and burn • 3,919 acres of prescribed fire using manual ignition (i.e., drip torch) techniques • 20.3 miles of NFS road would be improved, decommissioned or obliterated to promote watershed health. 	<p>Alternative C is designed to fulfill 2004 SNFPA ROD and FEIS land management direction standards and guidelines:</p> <p>Wood by-products from these treatments are expected to produce 5.3 million board feet of commercially-valuable timber volume (20 acres of skyline logging);</p> <ul style="list-style-type: none"> • 1,315 acres of fuel treatments using area thinning. <p>Timber harvest operations require 3.5 miles of NFS classified road reconstruction, 2.8 miles of unclassified road construction (closed post operations) and the construction of 21 new landing sites.</p> <ul style="list-style-type: none"> • 334 acres of mastication • 1,542 acres of hand thin, pile, and burn • 91 acres of hand thin, grapple pile, and burn • 3,643 acres of prescribed fire, including 331 acres within the federally-administered Valley Creek Special Interest Area (SIA). 	<p>Alternative D is designed to fulfill 2004 SNFPA ROD and FEIS land management direction standards and guidelines.</p> <p>Wood by-products from these treatments are expected to produce 4.6 million board feet of commercially-valuable timber volume</p> <ul style="list-style-type: none"> • 859 acres of variable density thinning and 76 acres of area thinning (no skyline logging) <p>Timber harvest operations require 3.6 miles of NFS classified road reconstruction, 2 miles of unclassified road construction (closed post operations) and the construction of 24 new landing sites.</p> <ul style="list-style-type: none"> • 278 acres of mastication • 1,401 acres of hand thin, pile, and burn • 71 acres of hand thin, grapple pile, and burn • 3,598 acres of prescribed fire, including 331 acres within the federally-administered Valley Creek Special Interest Area (SIA) • 16.9 miles of NFS road would be improved, decommissioned or obliterated.

Table 2-11. Comparison of Alternatives Considered in Detail - Purpose and Need

Purpose	Need	Measurement Indicators	Alternative A (No-Action)	Alternative B (HFQLG Act)	Alternative C (2004 SNFPA: Fuels Reduction Only)	Preferred Alternative D (2004 SNFPA)
1. Achieve desired fire behavior to reduce wildfire risk to natural resources on National Forest System (NFS) land(s) and the at-risk communities of LaPorte and American House.	1. Reduce hazardous fuel accumulations.	Flame length (ft)	1–100 ft	1–4 ft within treatment units 1–41 ft average within Project Area (13 percent not treated)	1–4 ft within treatment units 1–50 ft average within Project Area (26 percent not treated)	1–4 ft within treatment units 1–41 ft average within Project Area (11 percent not treated)
		Canopy base height (ft)	1–68 ft	1–83 ft	1–83 ft	1–83 ft
		Fire type	Surface/ Passive/Active	Primarily Surface/Passive	Primarily Surface/Passive	Primarily Surface/Passive
2. Modify tree crown densities, tree species composition and forest structures to develop a mosaic of full-sun and interior filtered-light, healthy forestland conditions, resilient to climate change and disturbances.	2. Establish disturbance resilient late seral forestland conditions (i.e., California Wildlife Habitat Relationship [CWHR] size classes 4M/4D and 5M/5D), capable of supporting 50 to 70 percent healthy canopy cover in California spotted owl home range core areas (CSO HRCAs).	Compositional structure (post treatment trees per/acre[tpa])	249 tpa (50–1101)	83 tpa (4–349)	129 tpa (34–408)	129 tpa (34–408)
		Average basal area in square ft/acre (post treatment)	309 ft ² /ac (1-422)	195 ft ² /ac (1-420)	231 ft ² /ac (1-420)	248 ft ² /ac (1-420)
		Forest structure (Relative stand density in percent) Post-Treatment Retention - Trees >24 in. dbh (percent)	68 percent (1–99) 100 percent	37 percent (1–86) 76 percent (18–100)	47 percent (1–86) 87 percent (51–100)	50 percent (1–86) 94 percent (51–100)

Purpose	Need	Measurement Indicators	Alternative A (No-Action)	Alternative B (HFQLG Act)	Alternative C (2004 SNFPA: Fuels Reduction Only)	Preferred Alternative D (2004 SNFPA)
3. Improve watershed health.	3. Reduce the number of improperly constructed and misaligned NFS roads	Road - Reconstruct	0 miles	4.9 miles	3.5 miles	3.6 miles
		Temporary Roads - New	0 miles	4.3 miles	2.8 miles	2.0 miles
		Temporary Roads - Reconstruct	0 miles	4.9 miles	3.2 miles	2.8 miles
		Road Decommissioning & Obliteration	0 miles	10.5 miles	0 miles	10.5 miles
		Revenue/Costs				
4. Afford a broad spectrum of wood by-products and job opportunities to contribute to the economic stability of rural communities.	4. Provide employment opportunities for rural communities dependent upon forest products for jobs and revenue.	Sawlog Harvest Volume (MMBF)				
		Sawlog and biomass harvest revenues	0	\$963,799 (Biomass optional)	\$672,061	\$585,515 (no biomass)
		Harvest costs	0	\$1,175,035	\$1,140,939	\$307,872
		Net harvest revenues	0	-\$211,236	-\$468,879	\$277,643
		Non-harvest costs (Fuels Treatments)	0	\$1,457,150	\$2,402,200	\$2,259,350
		Total project value	0	-\$1,668,386	-\$2,871,078	-\$1,981,707
		Employment/Income				
		Potential Direct and Indirect Jobs				
		Potential Employee Income	0	\$6,529,009	\$7,978,070	\$6,322,505

For the purpose of this FEIS analysis, tables 2-12 to 2-16 display determination of effects to the social, physical and biological human environment by alternative.

Table 2-12. Summary of effects to watershed and aquatic wildlife resources by alternative.

Measurement Indicators	Alternatives Considered in Detail			
	Alternative A (No-Action)	Alternative B (Proposed Action - HFQLG Act)	Alternative C (Fuels Reduction Only)	Alternative D (Preferred 2004 SNFPA)
Potential Direct, Indirect and Cumulative Effects to Sierra Nevada yellow-legged frog	Will not affect	Will not affect	Will not affect	Will not affect
Potential Direct, Indirect and Cumulative Effects to Pacific pond turtle	Will not affect	May Affect Individual, but is not likely to result in trend toward Federal listing of viability	May Affect Individual, but is not likely to result in trend toward Federal listing of viability	May Affect Individual, but is not likely to result in trend toward Federal listing of viability
Potential Direct, Indirect and Cumulative Effects to Foothill yellow-legged frog	Will not affect	May Affect Individual, but is not likely to result in trend toward Federal listing of viability	May Affect Individual, but is not likely to result in trend toward Federal listing of viability	May Affect Individual, but is not likely to result in trend toward Federal listing of viability
Potential Cumulative Effects to Water Quality: Change in Threshold of Concern (TOC)	No Change. The percent of TOC for the subwatersheds range from 24 to 136 with subwatershed 15 being over threshold at 136%, subwatershed 5 approaching threshold at 95%, and subwatershed 11 at 97% of TOC. The ERA totals for all remaining subwatersheds are below the TOC. Will not affect beneficial uses.	Alternative B would result in subwatersheds 5, 6, and 8 to be over the TOC. Subwatershed 15 that is already over TOC is predict to have an increase in percent TOC. Subwatershed 11 would reach TOC. Will not affect beneficial uses.	Alternative C reveals similar effects when compared to alternative B. All 16 subwatersheds would result in an increase in their TOC percentage, with the same three subwatersheds (5, 6, and 8) predicted to be over TOC. Subwatershed 15 that is already over TOC is predict to have an increase in percent TOC. Subwatersheds 1 and 11 are approaching TOC. Will not affect beneficial uses.	Alternative D would result in subwatersheds 5, 6, and 8 to be over the TOC. Subwatershed 15 that is already over TOC is predict to have an increase in percent TOC. Subwatershed 11 would reach TOC. Will not affect beneficial uses.
			Since the road obliterations proposed under Alternative B would not occur, fewer localized improvements in water quality would be realized.	
Potential Direct and Indirect Effects to Water Quality: Road density (miles per square mile)	3.22–9.59 miles per sq mile	4.7% decrease in road density	No decrease in road density 3.22–9.59 miles per sq mile	4.7% decrease in road density

Measurement Indicators	Alternatives Considered in Detail			
	Alternative A (No-Action)	Alternative B (Proposed Action - HFQLG Act)	Alternative C (Fuels Reduction Only)	Alternative D (Preferred 2004 SNFPA)
Potential Direct and Indirect Effects to Water Quality: Best Management Practices Evaluation Program (BMPEP).	Not applicable	In most cases, BMP evaluations rate a "fail" when sediment is introduced into a stream channel adjacent to a project activity. While correction of all legacy factors is currently not feasible due to temporal and fiscal constraints, proposed decommissioning, obliteration, reconstruction and maintenance of roads under alternative B would correct the worst of the observed legacy factors contributing to water quality impacts.	Reductions of sedimentation would be foregone, as road decommissioning and obliteration is not proposed under alternative C.	In most cases, BMP evaluations rate a "fail" when sediment is introduced into a stream channel adjacent to a project activity. While correction of all legacy factors is currently not feasible due to temporal and fiscal constraints, proposed decommissioning, obliteration, reconstruction and maintenance of roads under alternative D would correct the worst of the observed legacy factors contributing to water quality impacts.

Table 2-13. Summary of effects to wildlife resources by alternative.

Terrestrial Wildlife Species	No Action Alternative A	Action Alternatives B, C, and D
Northern goshawk (<i>Accipiter gentilis</i>)	Will not affect	May affect individual, but is not likely to result in trend toward Federal listing of viability
California spotted owl (<i>Strix occidentalis occidentalis</i>)	Will not affect	May affect individual, but is not likely to result in trend toward Federal listing of viability
American marten (<i>Martes americana</i>)	Will not affect	May affect individual, but is not likely to result in trend toward Federal listing of viability
Pacific fisher (<i>Martes pennanti pacifica</i>)	Will not affect	May affect individual, but is not likely to result in trend toward Federal listing of viability
Pallid bat (<i>Antrozous pallidus</i>)	Will not affect	May affect individual, but is not likely to result in trend toward Federal listing of viability
Townsend's big-eared bat (<i>Corynorhinus townsendii</i>)	Will not affect	May affect individual, but is not likely to result in trend toward Federal listing of viability

Table 2-14. Summary of effects to wildlife resources by alternative.

Old-forest Dependent Species and Habitats	Alternative A	Alternative B	Alternative C	Alternative D
<p>Suitable Nesting and Roosting Habitats (CWHR size classes 4M4D/5M5D)</p>	<p>No immediate change in wildlife habitat conditions</p> <p>Habitat conditions would continue to progress in response to natural ecological succession.</p> <p>There is uncertainty as to the risk and percentage of reduced habitat that would occur from a wildfire if treatments did not occur.</p>	<p>Moderate risk reduction of potential habitat loss due to wildfire.</p> <p>Reduces 25% of stands suitable to old-forest dependent species to an unsuitable condition (open forest canopy or early seral):</p> <ul style="list-style-type: none"> • Group Selection 80 acres 4M/4D/5M • Mechanical Thinning 933 acres reduces 19% of 4M and 4D size class trees (4M 236 acres 40% canopy cover and 4D 697 acres 40% canopy cover) • Hand-cut-burn/Mastication/Underburn 2,031 acres reduces 42% of the understory in these in size class 5M, 4M and 4D (5M 275 acres, and 4M/4D 1,756 acres) • Landings 48 acres in 4M/4D. 	<p>Moderate risk reduction of potential habitat loss due to wildfire.</p> <p>Reduces 5% of CWHR size-density class 4M stands suitable to old-forest dependent species to an unsuitable condition (open forest canopy):</p> <ul style="list-style-type: none"> • Group Selection 0 acres • Mechanical Thinning 879 acres reduces 18% of 5M and 4D size class trees (5M 110 acres 50% canopy cover 4M 23 acres 50 % canopy cover 4M 186 acres 40% canopy cover 4D 235 50% canopy cover and 4D 325 40% canopy cover) • Hand-cut-burn/Mastication/Underburn 1,998 acres reduces 42% of the understory in these in size class 5M, 4M and 4D (5M 180 acres and 4M/4D 1,818 acres). • Landings 21 acres in 4M/4D. 	<p>Moderate risk reduction of potential habitat loss due to wildfire.</p> <p>Since Alternative D does not include Group Selection, has the least amount of mechanical thinning acres; whereby treatments are specifically designed to retain all suitable habitats for old-forest dependent species (i.e., no open forest canopy or early seral conditions created), it has least potential to impact Forest Service sensitive species compared AlternativesB and C:</p> <ul style="list-style-type: none"> • Group Selection 0 acres • Mechanical Thinning 741 acres reduces 15% of size class trees 4M and 4D (4M 203 40% canopy cover 4D 359 50% canopy cover and 4D 179 acres 40% canopy cover) • Hand-cut-burn/Mastication/Underburn 2,432 acres reduces 51% of the understory in these in size class 5M, 4M and 4D (5M 327 and 4M/4D 2,105 acres) • Landings 17 acres in 4M/4D.

Table 2-15. Summary of effects to physical and biological resources by alternative (continued).

Table 2-15. Summary of effects to physical and biological resources by alternative.

NFS Land Resources	Alternative A	Alternative B	Alternative C	Alternative D
Air Quality - Emissions				
Predicted Emissions of Wildfire Compared to Action Alternatives (compares predicted emissions of a wildfire the size of the areas treated)	2,979 tons in the event of a wildfire	951.26 tons	1,093.74 tons	1,122.24 tons
Productivity for Plant Growth and Soil Hydrologic Function				
Change to Effective Soil Cover	N/A	All proposed treatment units are expected to meet the project standard for effective soil cover due to overall high percentage of effective soil cover, LOPs, BMPs, design features and mitigations. Treatment units 002A and 002B would be monitored for effective soil cover post implementation.	Alternative C overall has the greater potential to effect effective soil cover because there are more acres of mechanical treatment that remove effective soil cover when compared to Alternatives B and D. All proposed treatment units are expected to meet the project standard for effective soil cover due to overall high percentage of effective soil cover, LOPs, BMPs, design features and mitigations.	All proposed treatment units are expected to meet the project standard for effective soil cover due to overall high percentage of effective soil cover, LOPs, BMPs, design features and mitigations. Treatment units 002A and 002B would be monitored for effective soil cover post implementation.
Percent Detrimental Compaction	N/A	1,286 acres of mechanical treatment.	1,740 acres of mechanical treatment. The potential for compaction is higher under Alternative C compared to Alternative B because of the net gain of 454 acres of mechanical treatment.	1,284 acres of mechanical treatment. The potential for compaction is 2 acres lower than Alternative B.
Fine organic matter	N/A	Units 002A, 002B, and 227B don't meet the desired condition for fine organic matter pre and post implementation. Units 046A, 046B, 573, 902, and 904A may not meet the desired condition post implementation.	Units 002A, 002B, and 227B would not meet desired condition because they are no treatment units in the aforementioned alternatives.	Units 002A, 002B, and 227B would not meet desired condition because they are no treatment units in the aforementioned alternatives.

NFS Land Resources	Alternative A	Alternative B	Alternative C	Alternative D
Botanical - Forest Service Sensitive plant species				
<i>Lewisia kelloggii</i> ssp. <i>hutchisonii</i>	MAI ^a	MAI	MAI	MAI
<i>Cypripedium fasciculatum</i>	MAI	MAI	MAI	MAI
<i>Peltigera hydrothyria</i> (lichen)	WNA ^b	WNA	WNA	WNA
<i>Lupinus dalesiae</i>	MAI	MAI	MAI	MAI
<i>Phaeocollybia olivacea</i> (fungus)	WNA	MAI	MAI	MAI
<i>Botrychium crenulatum</i>	MAI	MAI	MAI	MAI
Botanical - invasive plant species				
Noxious Weeds	Low potential for weed spread	Slightly increased potential for weed spread proportional to amount of ground disturbed; minimized through avoidance mitigation and prevention measures.	Slightly increased potential for weed spread proportional to amount of ground disturbed; minimized through avoidance mitigation and prevention measures.	Slightly increased potential for weed spread proportional to amount of ground disturbed; minimized through avoidance mitigation and prevention measures.

a. May affect individual, but is not likely to result in trend toward Federal listing of viability.

b. Will not affect.

Table 2-15. Summary of effects to physical and biological resources by alternative (continued).

Table 2-16. Summary of effects to the social environment by alternative.

NFS Land Resources and Amenities	Alternative A	Alternative B	Alternative C	Alternative D
Cultural Resources				
Potential physical damage or loss of sites and features	No effect	No effect	No effect	No effect
Recreation, Visuals and Public Safety				
Effects to recreation users	No change	Short-term conflicts between users during operations would be minor and associated with short term increases in traffic, noise, smoke, and dust from project activities causing minor disruption to recreationists and dispersed camping. Proposed treatments may temporarily restrict access to dispersed hiking, or temporarily affect the visual character of the roads and roadside scenic views. There would be no effect to human safety through avoidance mitigation.	Short-term conflicts between users during operations would be minor and associated with short term increases in traffic, noise, smoke, and dust from project activities causing minor disruption to recreationists and dispersed camping. Proposed treatments may temporarily restrict access to dispersed hiking, or temporarily affect the visual character of the roads and roadside scenic views. There would be no effect to human safety through avoidance mitigation.	Short-term conflicts between users during operations would be minor and associated with short term increases in traffic, noise, smoke, and dust from project activities causing minor disruption to recreationists and dispersed camping. Proposed treatments may temporarily restrict access to dispersed hiking, or temporarily affect the visual character of the roads and roadside scenic views. There would be no effect to human safety through avoidance mitigation.
Effects to Scenic Quality	No direct effects to visual quality. However, the lack of treatments would perpetuate existing dense forest canopy. Long-term potential loss of scenic quality and integrity due to wildfire.	Scenic quality would be improved. Short-term negative effect in variable density thinning, mechanical thinning and mastication units. Long-term scenic integrity effects in group selection units. Long-term benefits to scenic integrity and stability.	Scenic quality would be improved. Short-term negative effect to scenic integrity. Greatest improvements in scenic stability. Long-term improvements to scenic integrity and stability.	Scenic quality would be improved. Short-term negative effect to scenic integrity. Moderate improvement to scenic stability. Long-term improvements to scenic integrity and stability.
Consistency with Travel Management Rule and most recent USFS policies	N/A	Fully consistent	Fully consistent	Fully consistent